Health, Safety and Reclamation Code for Mines in British Columbia

BRITISH
COLUMBIA

Ministry of Energy and Mines
Mining Division

Victoria, British Columbia

2003

103-06448/

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Canadian Cataloguing in Publication Data

Main entry under title:
Health, safety and reclamation code for mines in
British Columbia

Previously published by Resource Management Branch, Ministry of Energy, Mines and Petroleum Resources, 1992. Reprint issued 1996.
Includes index.
ISBN 0-7726-3150-6

1. Mine safety — Law and legislation — British Columbia. 2. Mineral industries — Health aspects — British Columbia. 3. Abandoned mined lands reclamation — British Columbia. 4. Reclamation of land — Law and legislation — British Columbia. 5. Mining law — British Columbia. I. British Columbia. Ministry of Employment and Investment. Health and Safety Branch. Regional Operations. II. British Columbia. Ministry of Energy, Mines and Petroleum Resources. Resource Management Branch. Health, safety and reclamation code for mines in British Columbia.

KEB409.7.M5B74 1997 344.711'0465 C97-960023-5
KEF3574.M5B74 1997

Message From The Minister

British Columbia's new Health, Safety and Reclamation Code for Mines in British Columbia 2003 (Code) marks the culmination of dedicated work and cooperation by the Ministry of Energy and Mines (Ministry) staff, and a tripartite committee consisting of members of mine management and labour representatives, chaired by the Chief Inspector of Mines.

The revisions to the Code reflect a rationalization of requirements that have reduced the regulatory burden on mine management, while, at the same time, ensuring a high standard of environmental protection, and worker and public health and safety. The Code was changed to be more results based. The implementation of performance standards has resulted in a 30 percent reduction in the regulatory count.

It is a tribute to this tripartite process that occupational health and safety professionals in other jurisdictions have adopted consultative procedures modeled on those used to develop and revise the Code.

I wish to express my thanks to Ministry staff and to the members of the committee, whose names and affiliations are listed on the following pages, for their valuable contribution in making mining the safest heavy industry in the Province.

Honourable Richard Neufeld
Minister of Energy and Mines

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MINES ACT

CHAPTER 293

[Updated to July 16, 2002]

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Definitions

1 In this Act:

"abandoned mine" means a mine for which all permit obligations under this Act have been satisfied and in respect of which the mineral claims have reverted to the government;

"agent" means a person having control of a mine on behalf of the owner;

"authorized person" means a qualified person appointed or designated by the manager to perform specified duties;

"chief inspector" means the Chief Inspector of Mines appointed by the minister and includes a person designated by the chief inspector to act on behalf of the chief inspector;

"closed mine" means a mine at which all mining activities have ceased but in respect of which the owner, agent or manager remains responsible for its compliance with this Act, the regulations and the code;

"code" means the health, safety and reclamation code established under this Act;

"cultural heritage resource" means a cultural heritage resource as defined in the *Mineral Tenure Act;*

"district inspector" means a person appointed by the chief inspector as an inspector with responsibility for a designated area within British Columbia;

"inspector" means a person appointed by the chief inspector as an inspector of mines;

"local union" means a union certified under the *Labour Relations Code* as the bargaining agent for employees or a unit of employees at a mine;

"management" means employees of a mine who act as supervisors;

"management co-chair" means the co-chair chosen for the occupational health and safety committee by the manager;

"manager" means the person appointed under section 21 to be responsible for the management and operation of a mine;

"mine" includes

(a) a place where mechanical disturbance of the ground or any excavation is made to explore for or to produce coal, mineral bearing substances, placer minerals, rock, limestone, earth, clay, sand or gravel,

(b) all cleared areas, machinery and equipment for use in servicing a mine or for use in connection with a mine and buildings other than bunkhouses, cook houses and related residential facilities,

(c) all activities including exploratory drilling, excavation, processing, concentrating, waste disposal and site reclamation,

(d) closed and abandoned mines, and

(e) a place designated by the chief inspector as a mine;

"occupational health and safety committee" means the joint worker management committee established for each mine under this Act;

"owner" includes every person who is the immediate holder, proprietor, lessee or occupier of a mine or of any part of it, but does not include a person who

(a) receives only a royalty or rent from a mine that is subject to a lease, grant or other authority for its working, or

(b) is the owner of the surface rights of land in, on or under which a mine exists but who is not the owner of the coal or minerals in it;

"qualified person" means a person who, in the opinion of the manager, is

(a) qualified because of the person's knowledge, training and experience to design, organize, supervise and perform the duties for which the person is appointed,

(b) familiar with the provisions of this Act, the code and the regulations that apply to the duties for which the person is appointed, and

(c) capable of identifying any potential or actual danger to health or safety in the workplace;

"supervisor" means a person who instructs, directs or controls workers in the performance of their duties and who is authorized by the manager to take or recommend disciplinary action against workers;

"worker" means a person who is an employee but does not include a supervisor;

"worker co-chair" means the co-chair chosen for the occupational, health and safety committee by the workers;

"workplace" means a place where work is carried out in, on or about a mine.

Application

2 This Act applies to all mines during exploration, development, construction, production, closure, reclamation and abandonment.

Chief inspector

3 The minister must designate in writing a person appointed under the *Public Service Act*, as the Chief Inspector of Mines.

Authority

4 The chief inspector has the rights and powers conferred on an inspector under this Act.

Power to appoint inspectors

5 The chief inspector may appoint persons as inspectors for the purposes of this Act.

Delegation of powers

6 The chief inspector may delegate in writing to an inspector any of the powers conferred on the chief inspector under this Act.

Accident investigations

7 An inspector may, and on the direction of the chief inspector must, make an investigation of and report about an accident that has caused serious personal injury, loss of life or property or environmental damage.

Powers of commissioner under *Inquiry Act*

8 An inspector conducting an investigation under section 7 has the protection, privileges and powers of a commissioner under sections 12, 15 and 16 of the *Inquiry Act*.

Advisory committee

9 The chief inspector must establish and chair an advisory committee and must establish regional advisory committees to review applications for mine approvals and reclamation permits, referred to them by the chief inspector, to assist the chief inspector in carrying out the duties of the chief inspector under this Act.

Permits

10 (1) Before commencement of any work in, on or about a mine, the owner, agent or manager must apply for and obtain a permit from the chief inspector and must, as part of the application, file with the district inspector a plan outlining the details of the proposed work and a program for the protection and reclamation of the land and watercourses affected by the mine, including the information, particulars and maps established by the regulations or the code.

(2) Despite subsection (1), if the chief inspector is satisfied that, because of the nature of the proposed work, it is not necessary to obtain a permit, the chief inspector may exempt in writing the owner, agent or manager from the requirement to comply with this section with respect to the proposed work.

(3) If the chief inspector considers the application for a permit is satisfactory the chief inspector may issue the permit, and the permit may contain conditions that the chief inspector considers necessary.

(4) The chief inspector may, as a condition of issuing a permit under subsection (3), require that the owner, agent or manager give security in the amount, form and subject to conditions specified by the chief inspector

(a) for mine reclamation, and

(b) to provide for protection of, and mitigation of damage to, watercourses affected by the mine.

(5) If required by the chief inspector, the owner, agent or manager, in each year, must deposit security in an amount and form satisfactory to the chief inspector so that, together with the deposit under subsection (4) and calculated over the estimated life of the mine, there will be money necessary to perform and carry out properly

(a) all the conditions of the permit relating to the matters referred to in subsection (4) at the proper time, and

(b) all the orders and directions of the chief inspector or an inspector respecting the fulfillment of the conditions relating to the matters referred to in subsection (4).

(6) The owner, agent or manager, or an inspector, may apply to the chief inspector for a revision of the conditions or an extension of the term of a permit issued under this section, and the chief inspector may revise the conditions or extend the term, as the case may be.

(7) For the purposes of subsection (6), if the chief inspector considers it necessary, the chief inspector may impose additional conditions or changes in the existing conditions, including changes to the security required or the term of the permit, with or without an application under this section.

(8) If the owner, agent or manager fails to perform and complete the program for reclamation or comply with the conditions of the permit to the satisfaction of the chief inspector, the chief inspector, after giving notice to remedy the failure, may

(a) cancel the permit and order the owner, agent or manager to stop the mining operation, and

(b) apply all or part of the security toward payment of the cost of the work required to be performed or completed.

(9) Each person who is an owner, agent or manager of a mine for which a permit is required under this section must ensure

(a) that there is a valid and subsisting permit for the mine, and

(b) that no work takes place in, on or about the mine, except under and in accordance with a valid and subsisting permit.

(10) [Repealed 2002-25-46.]

Permits – powers of minister

11 If the minister considers it to be necessary in the public interest, the minister, in respect of the issuing of permits, has and may exercise all the powers that the chief inspector may exercise under this Act.

Mine reclamation fund

12 (1) In this section **"fund"** means the mine reclamation fund.

(2) The Lieutenant Governor in Council may, by regulation, establish a fund to be known as the mine reclamation fund into which must be paid security, that is in the form of money, given by the owner, agent or manager of a mine under section 10.

(3) Money received from an owner, agent or a manager must be credited to a separate account in the fund in the name of the mine.

(4) The minister may requisition payments from an account in the fund

(a) to refund money and interest earned on it to the owner, agent or manager of a mine from time to time if in the opinion of the chief inspector it is no longer required for mine reclamation and protection of, and mitigation of damage to, land and watercourses affected by the mine, or

(b) to pay for the cost of work required under section 10 (8) (b).

Variance of regulations or code for individual mine

13 (1) On receiving a written application from the manager, the occupational health and safety committee or the local union requesting the suspension or variance of a provision of the regulations or of the code, the chief inspector may suspend or vary the provision if the chief inspector is of the opinion that the provision does not operate in the best interest of, or is not necessary to, health and safety in an individual mine.

(2) The chief inspector must ensure that the parties affected by the application are advised of the application for, and the subsequent decision respecting, a variance.

(3) The chief inspector must maintain a register of all variances.

(4) At least once every 5 years, the chief inspector

(a) must review each variance and advise the manager, occupational health and safety committee and local union that the chief inspector intends to review the variance, and

(b) after reviewing any submissions, must advise them whether or not the variance is to continue.

Discrimination

14 (1) Each manager must ensure that no employee is discriminated against in any manner, including adversely affecting any term or condition of employment, for complying with this Act, the regulations or the code.

(2) If advised in writing of an alleged case of discrimination against an employee for complying with this Act, the regulations or the code or refusing to work because it would result in a contravention of this Act, the regulations or the code, the chief inspector must investigate and report the findings to the manager and occupational health and safety committee, and the local union, if any.

(3) If the chief inspector is satisfied that the allegation is true, the chief inspector may make one or more orders requiring the employer to do one or more of the following:

(a) cease the discrimination;

(b) hire or reinstate the employee;

(c) pay the employee any wages lost by reason of the discrimination;

(d) pay the employee reasonable and actual out of pocket expenses incurred by the employee by reason of the discrimination.

Inspections

15 (1) An inspector may inspect a mine at any time.

(2) If an inspector is making a health and safety inspection, on arrival at the mine the inspector must request the manager to arrange for the worker co-chair or designate and the management co-chair or designate each to appoint a representative to accompany the inspector on the inspection.

(3) Despite subsection (2), an inspector may perform the inspection without either or both management and worker representatives, if on completion of the inspection the inspector meets with or otherwise communicates with each co-chair or each designate of a co-chair to discuss the inspector's findings and their occupational, health and safety concerns, if any.

(4) An inspector must complete an inspection report within 7 days and promptly provide the manager, and, in the case of a health and safety inspection, the occupational health and safety committee and local union with a copy of the inspection report on its completion, and the report must

  (a) list the workplaces inspected,

  (b) list the infractions noted, and

  (c) order remedial action and specify time limits for compliance.

(5) If an inspector is of the opinion that a delay in remedying a hazard would be dangerous to persons or property, the inspector must issue an order

  (a) for immediate remedial action,

  (b) to suspend regular work until remedial action is taken, or

  (c) to close the mine or part of it until remedial action is taken.

(6) Within 15 days after receiving the inspection report, the manager must

  (a) submit a written report outlining the remedial steps taken and the work still outstanding, and

  (b) promptly provide a copy to the district inspector, and, in the case of health and safety matters, the occupational health and safety committee and the local union.

Order not to interfere with public works, etc.

16 An inspector may order the operation of a mine to be conducted in a manner that will not interfere with a public work, public service, public utility, highway or railway, or with a pipeline as defined in the *Pipeline Act* or an adjacent mine property.

Abandoned mine

17 (1) If an inspector is of the opinion that work may be necessary in, on or about a closed or abandoned mine in order to avoid danger to persons or property or to abate pollution of the land and watercourses affected by the mine, the inspector may enter on or below the surface of the mine and may cause work to be done to remove or alleviate the danger or remedy the pollution.

(2) The costs incurred for work done under this section must be paid from the consolidated revenue fund without an appropriation other than this subsection.

(3) The amount expended plus interest at a prescribed rate is a debt due to the government and forms a lien and charge on the mine or mineral title in favour of the government.

(4) Notice of the debt in the prescribed form may be registered as a charge in the land title office or in the office of the chief gold commissioner, and no transfer of title or other dealing with the mine may take place until the debt is paid and the notice cancelled.

(5) With or without payment and on conditions the minister may impose, the minister may cancel the notice registered under subsection (4) and, on that happening, the mine may be transferred or otherwise dealt with.

Engineering report

18 An inspector may order the owner, agent or manager to provide at the owner's expense an independent study prepared by an engineer or other licensed professional acceptable to the inspector

(a) respecting health and safety at the mine or safety of its equipment, buildings, workings or structures, or

(b) in connection with an accident or a dangerous occurrence that the inspector is investigating.

Immunities

19 (1) No action for damages may be brought against the chief inspector or an inspector because of anything done or omitted in good faith

(a) in the performance or intended performance of any duty under this Act, the regulations or the code, or

(b) in the exercise or intended exercise of any power under this Act, the regulations or the code.

(2) Subsection (1) does not absolve the government from vicarious liability for an act or omission of the chief inspector or an inspector for which act or omission the government would be vicariously liable if this section were not in force.

Designation under *Coroners Act*

20 For the purpose of section 36 (1) of the *Coroners Act*, an inspector or a person designated by an inspector is deemed a person whose interests may be affected by evidence likely to be adduced at an inquest.

Appointment of manager

21 An owner or agent must,

(a) before work begins, appoint a manager and ensure that there is a person acting in that capacity at all times,

(b) immediately after each appointment, notify the district inspector in writing, of the name of the manager, and

(c) provide the manager or the manager's designate with every facility for conducting the operation of the mine in accordance with the requirements of this Act, the regulations and the code.

Manager's qualifications and responsibility

22 (1) Each manager and designate must possess qualifications established by the regulations or the code.

(2) The manager or designate must attend daily at an operating mine.

Manager's absence

23 Each manager must appoint a qualified person to be responsible during the manager's absence to ensure compliance with this Act, the regulations and the code.

Compliance

24 (1) The owner, agent or manager must take all reasonable measures to ensure compliance with this Act, orders issued under it, the regulations and the code.

(2) Every supervisor and employee must take all reasonable measures to ensure that the requirements of this Act, the regulations, the code and orders applicable to the work they perform or over which they have supervision are followed.

Contractors

25 (1) If work in or about a mine is let to a contractor, the contractor and the contractor's manager, as well as the owner, agent and manager of the mine, must take all reasonable measures to ensure compliance with the provisions of this Act, the regulations, the code and orders under this Act pertaining to the work over which they have control.

(2) In a case of noncompliance with subsection (1), the contractor and the contractor's manager commit an offence that is punishable in the same manner as if the contractor and contractor's manager were the owner, agent or manager of the mine.

Supervision required

26 Each manager must ensure that every person employed at a mine, if required by the regulations or the code, is under the daily supervision of a person who holds a valid and appropriate certificate as required by the regulations or the code.

Mine plans

27 Each manager must keep in the office at the mine site accurate plans that

(a) are updated every 3 months,

(b) are prepared on a scale that accords with good engineering practice, and

(c) contain particulars established by the regulations or the code.

Employment register

28 Each manager must maintain, in a form prescribed by the chief inspector, a register of every person who is or has been employed at the mine and, if the mine is closed down or if required by the district inspector, must forward a copy, certified by the manager to be a true copy, to the district inspector.

Alternative employment

29 If an inspector makes an order under section 15 (5) (b) or (c), and the manager is unable to provide alternate employment, the manager must pay or cause to be paid to each worker the amount that the worker would have earned or been likely to earn for each day the closure continues, up to a maximum of 3 working days.

Posting of reports and orders

30 (1) Each manager must post in a conspicuous place at the mine all inspection reports and orders issued by an inspector and must maintain them there for 30 days.

(2) Each manager must ensure that all documents required to be posted are maintained in a legible condition.

Assistance to inspectors

31 The owner, agent, manager and all persons in, on or about a mine must provide an inspector with every facility necessary for the completion of an inspection or investigation.

Occupational health and safety committee

32 (1) Each manager must ensure that an occupational health and safety committee is established in accordance with the regulations or the code.

(2) A manager must allow committee members to participate in inspections, investigations and meetings of the committee under this Act, and that participation must be considered as time worked.

Appeal to chief inspector

33 (1) A person who is adversely affected by a decision, order or ruling of an inspector may appeal the decision, order or ruling in writing to the chief inspector within 30 days after the date of its issue.

(2) The manager, occupational health and safety committee and local union must be given an opportunity to make a submission on the matter of the appeal, receive copies of all submissions and be notified of the chief inspector's decision on the appeal.

(3) An appeal taken under this section does not operate as a stay or suspend the operation of the decision being appealed unless the chief inspector orders otherwise.

Health, safety and reclamation code committee

34 (1) The minister must establish a health, safety and reclamation code committee consisting of the members the minister appoints.

(2) The chief inspector is a member and the chair.

(3) The committee must prepare a code dealing with all aspects of health, safety and reclamation in the operation of a mine and may amend the code from time to time as required.

(4) A provision of the code may specify that the approval or consent of an inspector or some other person is required before a specified action may be taken.

(5) Without limiting subsection (4), the code may require approval or consent before a specified type of equipment is used at a mine or continues to be used in specified circumstances.

(6) The code and any amendments to it come into force on approval of the Lieutenant Governor in Council.

(7) If there is a conflict between a provision of the code and a provision of the regulations, the regulations apply.

(8) Where there is a conflict between a provision of the code and a provision of the *Freedom of Information and Protection of Privacy Act*, the code applies.

(9) Subsection (8) does not apply to personal information, as defined in the *Freedom of Information and Protection of Privacy Act*, that has been in existence for 100 or more years or to other information that has been in existence for 50 or more years.

Enforcement of code

35 (1) If an inspector finds that a mine is not being operated in accordance with the provisions of the code, the inspector may order the owner, manager or agent to comply with the code.

(2) If a person fails or refuses to comply with an order of an inspector under this section, the inspector may apply to the Supreme Court for an injunction restraining the person from disobeying the order.

Annual report

36 The chief inspector must publish an annual report showing results during the previous year in achieving the purposes of this Act.

Offence and penalty

37 (1) A person who obstructs, impedes or otherwise interferes with an inspector in carrying out the inspector's duties under this Act commits an offence.

(2) A person who contravenes a provision of this Act, the regulations, the code or an order made under any of them commits an offence.

(3) A person who commits an offence is liable to a fine of not more than $100 000 or to imprisonment for not more than one year or both.

(3.1) The time limit for laying an information for an offence

(a) under section 10 is one year after the facts on which the information is based first came to the chief inspector's attention, and

(b) under this Act, other than section 10, is 6 months after the facts on which the information is based first came to the chief inspector's attention.

(3.2) A document purporting to have been issued by the chief inspector, certifying the date on which the chief inspector became aware of the facts on which an information is based,

(a) is admissible without proof of the signature or official character of the individual appearing to have signed the document, and

(b) is proof of the certified facts unless there is evidence to the contrary.

(4) If an inspector serves a written notice on a person alleging a contravention of this Act, the regulations or the code, or an order under any of them, that person, on conviction, is liable to a penalty, in addition to the penalties provided under subsection (3), not more than $5 000 and not less than $500 for every day during which the offence continues to be committed after receipt of the notice.

(5) If a corporation commits an offence, a director or officer of the corporation who authorized, permitted or acquiesced in the offence is, even if the corporation is convicted, liable to the penalty set out in subsection (3).

Power to make regulations

38 (1) The Lieutenant Governor in Council may make regulations referred to in section 41 of the *Interpretation Act*.

(2) Without limiting subsection (1), the Lieutenant Governor in Council may make regulations as follows:

(a) governing exploration, development, operation, closure and abandonment of mines and mining property;

(a.1) respecting applications for, and the issuance of, permits and approvals, including but not limited to prescribing time limits within which specified steps in the application process must be taken;

(b) respecting the type, application, use and operation of equipment, machinery and other property in, on or about mines, whether moveable or immovable or whether used in mining operations or not;

(c) relating directly or indirectly to the health and safety of all persons, including the public, in, on or about mines, either underground or on the surface;

(d) respecting standards for environmental protection and reclamation;

(e) respecting the conservation of cultural heritage resources;

(f) requiring management to give members of the occupational health and safety committee access to relevant records;

(g) requiring management to give access to the mine and to its records for the purposes of investigation of death or injury, accidents or dangerous or unusual occurrences;

(h) requiring management to forbid a person to enter or engage in work if the person is impaired or has drugs or liquor in the person's possession;

(i) requiring management to forbid persons to engage in horseplay.

(3) A regulation under subsections (1) or (2) may

(a) make different provisions for different mines or for different classes or types of mines,

(b) adopt all or part of a code or standard published by a national or international standards association, as amended from time to time,

(c) specify that the approval or consent of an inspector or some other person is required before a specified action may be taken, and, without limiting this section, may require approval or consent before a specified type of equipment is used at a mine or continues to be used in specified circumstances,

(d) delegate to inspectors the power, by order, to vary codes, standards and other prescribed matters in the interests of health and safety in individual mines, and

(e) limit, restrict or prohibit, for a prescribed period of time, exploration or mining of uranium, if the uranium is more than a prescribed amount or proportion, within any or all mines, and to close, in the interest of health or safety, any mining operation in which more uranium than the prescribed amount or proportion is found.

(4) If a regulation is made that results in a limitation, restriction or prohibition on exploration or development or results in the closure of a mining operation, the chief inspector may, on conditions ordered by the chief inspector, consent to

(a) the recommencement of exploration or development, or

(b) the opening of a mining operation that has been closed under that regulation.

B.C. Reg. 126/94 Deposited April 28, 1994
O.C. 528/94

Mines Act

MINES REGULATION

Investigation by inspector

1 An inspector may, during the exploration, development, operation, closure or abandonment of a mine, investigate any matter relating directly or indirectly to the health and safety of any person or the public, including an investigation with respect to

(a) death or injury,
(b) accidents,
(c) dangerous or unusual occurrences, or
(d) complaints or allegations relating to health or safety,

and, for the purposes of an investigation, management must provide the inspector with access to all of the mine, including the underground and surface portions, and all mine records.

[Provisions of the *Mines Act*, R.S.B.C. 1996, c. 293, relevant to the enactment of this regulation: section 38 (2) (a), (c) and (g)]

Queen's Printer for British Columbia©
Victoria, 1999

PURPOSE

The purpose of the Code is to:

(1) Protect employees and all other persons from undue risks to their health and safety arising out of or in connection with activities at mines.
(2) Safeguard the public from risks arising out of or in connection with activities at mines.
(3) Protect and reclaim the land and watercourses affected by mining.
(4) Monitor the extraction of mineral and coal resources and ensure maximum extraction with a minimum of environmental disturbance, taking into account sound engineering Practice and prevailing economic conditions.

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PROVINCE OF BRITISH COLUMBIA

ORDER OF THE LIEUTENANT GOVERNOR IN COUNCIL

Order in Council No. 0283 *Approved and Ordered* MAR 28 2003

Lieutenant Governor

Executive Council Chambers, Victoria

On the recommendation of the undersigned, the Lieutenant Governor, by and with the advice and consent of the Executive Council, orders that

approval is given to the amendments prepared by the Health, Safety and Reclamation Committee dated February 24, 2003, to the Health, Safety and Reclamation Code.

Richard Neufeld

Minister of Energy and Mines

Presiding Member of the Executive Council

(This part is for administrative purposes only and is not part of the Order.)

Authority under which Order is made:

Act and section: *Mines Act*, R.S.B.C. 1996, c. 293, section 34

Other (specify): OIC 519/98

March 5, 2003 313 /2003/13

Application of Code and General Rules

Definitions

"*accident*" means an unintended event that results in physical harm to a person or damage to property.

"*board*" in this part means the Board of Examiners appointed under part 1.13.1 of the Code

"*C.S.A.*" means the Canadian Standards Association.

"*certified person*" means a person who is certified by an agency or board acceptable to the chief inspector.

"*construction*" includes any activity involving the erection, modification, or dismantling of any structure or building and any road building associated therewith.

"*employees*" means all persons employed at a mine.

"*hazard*" means an unsafe or harmful condition, substance, or circumstance.

"*hazardous*" means the existence, or reasonable probability of the existence, of an unsafe or harmful condition, substance, or circumstance.

"*Musculoskeletal Disorders (MSD)*" means the term used to describe disorders of the bones, joints, ligaments, tendons, muscles and other soft tissues. These disorders refer to a whole range of conditions affecting different parts of the body.

"*occupational illness*" means a condition that results from exposure, in a workplace, to a physical, chemical, or biological agent to the extent that the normal physiological mechanisms are affected causing impairment to the worker.

"*suitable*" means suitable to the satisfaction of the inspector.

"*Professional Engineer*" is a person who is registered to Practice in the Province of British Columbia, according to the *Engineers and Geoscientist Act* , or a person working for a Firm which is licensed to practice in the Province of British Columbia, pursuant to the *Engineers and Geoscientist Act* and is qualified to practice in the relevant discipline.

Application of Code

Application

1.1.1 This code applies to
  (a) all mines in the Province of British Columbia; and
  (b) the manager shall ensure that all employees who supervise workers are familiar with all appropriate parts of the act, regulations, and the code.

Absence of Code Requirements

1.1.2 Notwithstanding the absence of a specific code requirement, all work shall be carried out without undue risk to the health or safety of any person.

Conflicting Codes

1.1.3 If any conflict should arise between this code and any other code or standard with which compliance is required by this code, the provisions of this code shall prevail.

1.1.4 Where this code adopts in whole or in part a code or standard published by a national or international standards association if directed by the chief inspector shall include amendments to such standards as made from time to time.

1.1.5 Unless otherwise ordered by the chief inspector, equipment and buildings purchased or constructed must be in compliance with the standard in effect at the time of purchase or construction.

Variance

Variance of Code Provision

1.2.1 On application, the chief inspector may, by order, authorize a variance from a provision of the code for a particular mine.

1.2.2 A variance may only be made if the chief inspector has considered any comments subject to 1.2.3(3), and is satisfied that the variance
  (a) affords protection for the workers equal to or greater than the protection established by the provision being varied, or
  (b) has substantially the same purpose and effect as the provision being varied.

1.2.3 The manager, the OHSC, or the local union or worker representative if there is no union, at an individual mine may
(1) submit a written request to the chief inspector for a variance of a provision of the code,
(2) shall, when submitting a request for a variance, provide the other two parties at the minesite with copies of the submission, and
(3) may within 30 days of receiving a copy of the request for a variance, submit to the chief inspector written comments on the request and provide a copy to the other two parties.

Postings **1.2.4** The manager shall ensure that a legible copy of each variance granted is posted and maintained on conspicuously located bulletin boards at the mine.

Authority to Enter a Mine

Authorization **1.3.1** Other than an inspector, only persons authorized by the manager shall enter or be permitted to enter a mine.

Posting **1.3.2** Notice to this effect shall be posted at all road entrances to the mine.

Unauthorized Access **1.3.3** Unless authorized by the manager, no persons shall enter or leave a mine except by a recognized means of entry or exit.

Posting and Distribution of *Mines Act*, Regulations, and Code

Manager's Responsibility **1.4.1** The manager shall ensure that
(1) every employee is given a copy of the *Mines Act*, the regulations, and the code, and provided additional copies at cost, and
(2) a copy of the *Mines Act*, the regulations, and the code is maintained in every safety office and at other suitable locations and available to employee.

Hours of Employment

Hours of Work

1.5.1 Notwithstanding the provisions of the *Employments Standards Act*, the manager shall ensure that, over the period of any work schedule, no worker shall be scheduled to work more than an average of 50 hours per week.
(1) The manager shall not permit the employment of a person at a surface mine for a period longer than 16 hours in any 24 hours;
(2) The maximum scheduled shift underground in a mine shall be no longer than 10 hours, and the manager shall not permit the employment of a person underground at a mine for a period longer than 12 hours in a 24 hour period;
(3) 1.5.1 does not apply to emergency where life or property is in danger, or
  (i) Where urgent work is essential to the continuation of the ordinary working of a mine, providing it is only on an infrequent basis, or
  (ii) where work schedules incorporate periodic shift changes within a 24-hour period.

Occupational Health and Safety Committee

Committee Members

1.6.1 The manager shall establish and maintain a joint management-worker Occupational Health & Safety Committee
  (a) at a mine where 20 or more workers are regularly employed, and
  (b) at any other mine when ordered by an inspector.

1.6.2 The Occupational Health and Safety Committee shall be composed of management and an equal or greater number of worker representatives, and such committee shall have
(1) two or more worker representatives, chosen by the workers , and

(2) two co-chairpersons, one of the worker representatives and the other a management representative, and they may alternate chairing the meetings

Inspections

1.6.3 The committee shall
(1) inspect as many of the work sites as it considers appropriate every month and as soon as possible after the inspection, meet to discuss its findings and any other matters concerning health and safety, and
(2) prepare minutes of the meeting including a description of conditions found during the inspection.

1.6.4 The minutes of the meeting referenced in section 1.6.3(2) shall be signed by the OHSC co-chairpersons or their designates and a copy shall without delay
(1) be filed with the manager, and
(2) be forwarded to the local union(s), and
(3) be displayed in a conspicuous location at the mine until replaced by the minutes of the next meeting, and
(4) be made available to an inspector on request.

Accident Investigation

1.6.5 The OHSC co-chairpersons or their designates shall participate in the investigation of reportable occurrences in accordance with section 1.7.1.

1.6.6 The OHSC co-chairpersons or their designates shall be informed as soon as possible, but within 4 hours of the event, of accidents that cause injuries which require medical aid and, if they deem it necessary, they shall participate in the investigation.

Cooperation With Committee

1.6.7 The manager and all persons working at the mine shall cooperate fully with the OHSC by
(1) providing it with every reasonable facility for carrying out its inspections and investigations, and
(2) allowing it access to all reports, plans, records and standards pertinent to the work of the OHSC, and
(3) correcting the safety hazards noted in the OHSC minutes by the date agreed by the OHSC committee.

OHSC Training

1.6.8 Where 20 or more workers are regularly employed, the manager shall arrange for a qualified person to provide the committee with training sessions on three occasions during the year.

Health and Safety Program

1.6.9 (1) The manager shall develop a Mine Health and Safety Program which includes the following sections
- (a) a written policy statement,
- (b) general safety rules,
- (c) safe working procedures on a departmental basis,
- (d) a list of hazardous materials, safe handling procedures and antidotes,
- (e) provision for the regular monthly crew safety meetings,
- (f) procedures for accident and serious incident investigation,
- (g) procedures for safety tour inspections, and
- (h) a written preventative training program, acceptable to the chief inspector, to educate OHSC members in the recognition, evaluation and prevention of adverse health effects resulting in Musculoskeletal Disorders (MSD) and in reporting related symptoms and injuries.

(2) The OHSC shall review the Mine Health and Safety Program, including OHSC Training, for completeness and effectiveness on an ongoing basis and submit its findings to the manager.

Entitlement to Time

1.6.10 The manager shall ensure that OHSC representatives are given reasonable time to carry out their duties as prescribed in the code and that time so spent is counted as time worked.

1.6.11 A worker health and safety representative chosen by the workers is required

(1)(a) at a mine where 9 but less than 20 workers are regularly employed, and

(b) at any other mine when ordered by an inspector.

(2) To the extent practicable, a worker health and safety representative has the same duties and functions as an OHSC.

1.6.12 Where there are 5 or less workers on a shift, or less than 9 workers in total employed at a mine, there shall be a crew safety meeting

(a) at the commencement of operations at a mine, and
(b) at least monthly thereafter, and
(c) minutes of these meetings shall be kept and made available to the inspector on request.

Accident or Dangerous Occurrences

Manager's Responsibility

1.7.1 In the event of

(a) any accident resulting in loss of life, or
(b) any dangerous occurrence as specified in section 1.7.3, or
(c) any accident resulting in a worker seeking medical aid.

The manager shall

(1) Inform an inspector, the OHSC and the local union as soon as possible but within 16 hours of the event, for an event under 1.7.1(a) or (b), and within one week send a written notification to an inspector, and for an event under 1.7.1(c) provide a monthly report to an inspector, the OHSC, the local union or employee association.

(2) For an event under section 1.7.1(a) or 1.7.1(b) ensure that, except for the purpose of saving life or relieving human suffering, the scene of the accident or occurrence is not disturbed without approval of

(a) the chief inspector in the event of a fatal accident, or
(b) the OHSC, or
(c) an inspector.

(3) Ensure that the investigation is carried out by persons knowledgeable in the type of work involved and the co-chairpersons of the OHSC or their designates.

Accident Investigation

1.7.2 On completion of the investigation, the manager shall prepare a report that
(1) to the extent practicable identifies the causes of the accident, and
(2) identifies any unsafe conditions, acts, or procedures which contributed in any manner to the accident, and
(3) makes recommendations which may prevent similar accidents, and
(4) is forwarded to the OHSC and an inspector.

Dangerous Occurrences

1.7.3 Dangerous occurrences to be reported shall include
(1) unexpected major groundfall or subsidence, whether on surface or underground, which endangers people or damages equipment or poses a threat to people or property,
(2) cracking or subsidence of a dam or impoundment dike, unexpected seepage or appearance of springs on the outer face of a dam or dike; loss of adequate freeboard, washout or significant erosion of a dam or dike, any of which might adversely affect the integrity of such structures,
(3) any accident involving a mine hoisting plant and including sheaves, hoisting rope, shaft conveyance, shaft, shaft timber, or headframe structure,
(4) unexpected inrush of water, mud, slurry, or debris,
(5) premature or unexpected explosion of explosives, gas or any dust,
(6) significant inflow or release of explosive or other dangerous gas,
(7) unplanned stoppage of the main underground ventilation system,
(8) a mine vehicle going out of control,
(9) outbreak of fire if it endangers persons or threatens or damages equipment and all underground fires,
(10) electrical equipment failure or incident that causes or threatens to cause injury to persons or damage to equipment or property, and
(11) any other unusual accident or unexpected event which had the potential to result in serious injury.

Personal Protective Equipment

Manager's Responsibility

1.8.1 The manager shall
(1) except for protective footwear and prescription eyeglasses, supply properly fitted personal protective equipment as required by the code,
(2) ensure that workers are instructed in the use and maintenance of the equipment, the reasons for it, and also on its location and limitations, and
(3) ensure that the equipment is adequate for its purpose.

Workers' Responsibility

1.8.2 All persons shall wear the personal protective equipment as required by the code.

Protective Hat

1.8.3 A protective hat complying with the relevant requirements of CSA Standard Z94.1-M1977 "Industrial Protective Headgear," and suitable for the type of work or activity being performed, shall be worn by persons where there is a risk of head injury or where required by the manager or an inspector. Where conditions may cause the hat to be accidentally dislodged
(1) a device shall be incorporated into the hat and worn in order to prevent the hat being dislodged during a fall, and
(2) in the case of underground work, a chin strap and hearing protection muffs attached to the hat shall be worn.

Protective Footwear

1.8.4 Protective footwear complying with the relevant requirements of CSA Standard Z195-M1984 "Protective Footwear", and suitable for the type of work or activity being performed, shall be worn by persons where there is a risk of foot injury or where required by the manager or an inspector.

Eye Protection

1.8.5 Properly fitting goggles, face shields, or other eye protective equipment complying with the relevant requirements of CAN/CSA Standard Z94.3-M88 "Industrial Eye and Face Protectors," and suitable for the type of work or activity being performed, shall be worn by a person who

(1) is handling or is exposed to any material which is likely to injure or irritate the eyes,
(2) is engaged in any work in which there is a risk of eye injury,
(3) has 20/200 vision or is blind in either eye, or
(4) is working or passing through an area which the manager or inspector has designated as requiring such protection.

Contact Lenses **1.8.6** No person shall wear contact lenses where prohibited by the manager.

Hearing Protection **1.8.7** Where noise levels exceed the requirements of Table 2-2, Part 2, persons shall wear hearing protectors which are selected, maintained and used in accordance with CSA Standard Z94.2-94 "Hearing Protectors."

Self Rescuer **1.8.8** All persons going underground in a mine shall carry a self rescuer approved in accordance with NIOSH 42 CFR Part 84 on their person, or in the case of equipment operators maintained within arms reach while they are operating the equipment.

1.8.9 Not withstanding section 1.1.4, standards identified in sections 1.8.3, 1.8.4, 1.8.5, 1.8.7, and 1.8.8, shall not be amended unless so directed by the chief inspector.

Workplace Conditions

General **1.9.1** The manager shall
(1) take all reasonable and practicable measures to ensure that the workplace is free of potentially hazardous agents and conditions which could adversely affect the health, safety, or well-being of the workers,

Control
(2) where practicable, institute controls at the source to ensure that workers are not exposed to a level of any physical, chemical, or radiation hazard in excess of the limits prescribed in the code or by an inspector, with the exception of unusual short term or emergency situations, and

Variance

(3) require that persons wear effective personal protective equipment in any situation where control at the source, as required by section 1.9.1(2), is impractical.

1.9.2 The manager shall at the end of each month provide the OHSC with a report of all reported first aid cases.

1.9.3 By January 31 of each year, the manager shall forward to the chief inspector a report for the previous calendar year which includes

(a) the total hours worked at the mine by all mine employees,
(b) the number of lost time injuries,
(c) the number of occasions where employees received medical aid,
(d) the number of days lost, and
(e) where required by an inspector a contractor shall provide the information required under 1.9.3(a) to (d).

Employees' Right to Refuse Work

Unsafe Work

1.10.1 A person shall not carry out any work or operate any equipment, tool, or appliance if he has reasonable cause to believe that to do so would create an undue hazard to the health or safety of any person.

1.10.2 A supervisor shall not knowingly perform or permit a worker to perform work which is, or could create, an undue hazard to the health or safety of any person.

Right to Refuse

1.10.3 A person who refuses to carry out any work or operate any equipment, tool, or appliance, in compliance with section 1.10.1, shall forthwith report the circumstances to his supervisor.

Supervisor Investigates

1.10.4 The supervisor receiving a report under section 1.10.3 shall forthwith investigate the matter and ensure that any hazardous condition is remedied without delay; or if, in his opinion the report is not valid, he shall inform the person who made the report.

Investigation

1.10.5 If the procedure provided for in section 1.10.4 fails to resolve the issue and the person continues to refuse to carry out the work, the supervisor or other management representative shall forthwith make an investigation in the presence of the person who made the report, together with another person having knowledge of the work in question and who is
(1) a worker representative or designate of the OHSC if available, or
(2) designated by the local union to represent the person refusing to carry out the work, or
(3) a co-worker selected by the person refusing to carry out the work.

Use of Alternate Worker

1.10.6 If the person still refuses to carry out the work after his supervisor and the other person have investigated the issue in accordance with section 1.10.5, and are both of the opinion that no undue hazard exists and that
(1) the refusal is considered to be justifiable for reasons peculiar to that particular person, and
(2) there is no justification for an alternate person to refuse to carry out the work in question then, the supervisor, after informing the alternate person of the reason for the refusal, may have him perform the work.

Manager Investigates

1.10.7 If the procedures in sections 1.10.4, 1.10.5 and 1.10.6 fail to resolve the issue, the manager shall
(1) conduct an investigation and either develop a plan that is acceptable to the persons who will do the work and which will allow the work to proceed safely, or suspend further work, and
(2) if the work is suspended or allowed to proceed, submit a report to the OHSC, local union, and an inspector, that describes the incident, shows compliance with the code and describes any remedial actions taken.

Training

Training

1.11.1 The manager shall ensure that
(1) workers are adequately trained to do their job or are working under the guidance of someone who has competency both in the job and in giving instruction, and
(2) ensure that all employees receive thorough orientation and basic instruction in safe work practices.

1.11.2 The manager shall maintain a record of all training workers and supervisors have received, and make this record available to an inspector upon request.

Supervision

Open Pit

1.12.1 Where 6 or more workers are employed at any one time in the mining activity at an open pit mine, the manager shall ensure that the workers are under the supervision of the holder of an open pit shiftboss certificate.

Underground Non Coal

1.12.2 The manager shall ensure that every worker working underground in a mine, other than a coal mine, is under the supervision of the holder of an underground shiftboss certificate.

Underground Coal Mine

1.12.3 The manager of an underground coal mine shall ensure that
1) every worker employed underground is under the supervision of the holder of an underground coal mine fireboss certificate, and
2) where more than 50 workers per shift are employed underground, a supervisor holding a second class certificate of competency shall be appointed as mine captain/general foreman and this person shall supervise all underground operations.

1.12.4 A certificate of competency of any class includes that of a lower class.

Manager

1.12.5 The manager of an underground coal mine, if required by the chief inspector, shall hold one of the following valid certificates of competency
(1) an underground coal mine fireboss if fewer than 10 persons are employed underground,
(2) a second class certificate of competency if fewer than 30 but more than 9 persons per day are employed underground, and
(3) a first class certificate of competency if 30 or more persons per day are employed underground.

Certification Procedure

Board Grants Certification

1.13.1 Examinations of applicants for underground shiftboss and fireboss certificates, open pit shiftboss certificates, and certificates of competency shall be carried out by a Board of Examiners, consisting of the chief inspector as chairman and two other inspectors appointed by the chief inspector.

1.13.2 One member of the Board of Examiners shall hold first class certificates of competency when dealing with matters pertaining to the certification of candidates for underground coal mines.

1.13.3 The Board of Examiners shall issue a shiftboss, fireboss or competency certificate when satisfied that the applicant.
(1) is conversant with the English language,
(2) is the holder of a first aid certificates to a standard required by the Board of Examiners,
(3) has an adequate knowledge of the *Mines Act*, the regulations, and the code and of other information and material considered necessary by the Board of Examiners, including, but not limited to, mine safety, mine rescue, and blasting practices and procedures, and

(4) has had at least three years' experience in and about the working of a mine, or has obtained a degree or diploma, approved by the Board of Examiners, in engineering from a university or technical institute and has had not less than one year of experience and such experience shall be acceptable to the Board.

1.13.4 Notwithstanding section 1.13.3, the Board of Examiners may grant a restricted shiftboss or fireboss certificate where the type of mine operation would not require the applicant to hold all of the qualifications included in section 1.13.3.

1.13.5 The Board of Examiners may grant a certificate to an applicant who holds a similar certificate granted by a jurisdiction outside the Province, if the Board of Examiners is satisfied that the standard of training and examination is equivalent to that required for the granting of a corresponding certificate under the code and, after oral examination of the applicant, that the applicant is sufficiently qualified.

1.13.6 Notwithstanding sections 1.13.3 and 1.13.4, the manager may issue on a one time basis a provisional shiftboss or fireboss certificate valid for no more than six months to an employee who has acceptable experience and training.

Validity of Certificates

1.13.7 A shiftboss or fireboss certificate or a certificate of competency issued under Part 1 of the code is conditional on the holder maintaining in force the other certificates required under section 1.13.3 (2), or as required by the Board of Examiners.

Suspension of Certificate by Inspector

1.13.8 (1) If, in the opinion of an inspector, an employee who is a supervisor at a mine has acted in a manner inconsistent with the act, regulations, or code, the inspector may order the manager to cease to employ that employee in a supervisory capacity.

(2) The person who was affected by the inspectors order in 1.13.8(1) may appeal the decision to the chief inspector.

1.13.9 (1) A shiftboss or fireboss certificate or a certificate of competency issued under section 1.13.3 may be suspended by an inspector if, in his opinion, the holder fails to comply with the act, the regulations, or the code, or is, by reason of incompetence or negligence, unfit to carry out his duties.

(2) The inspector shall immediately inform the Board of Examiners of any such suspension, and the Board may:

(a) conduct an investigation,

(b) interview the holder of the certificate, and

(c) vary the suspension or cancel the certificate.

(3) The person whose certificate was cancelled or suspended pursuant to Part 1.13.9 (1) may appeal the decision to the Minister.

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Occupational Health

Definitions

"asbestos free" means containing less than 1% asbestos.

"biological monitoring" means the recording of serial medical tests or examinations which indicate the progressing health status of an individual or group of individuals.

"board" in the part means the Workers' Compensation Board of British Columbia.

"bulk shipment" means a shipment of a controlled product that is contained, without intermediate containment or intermediate packaging, in
- (1) a vessel with a water capacity of more than 454 L,
- (2) a freight container, a portable tank, a road vehicle, a railway vehicle, a ship, barge or other type of vessel, or an aircraft, or
- (3) a pipeline.

"certified audiometric technician" means a person certified by the Ministry or by an agency or persons acceptable to the chief inspector.

"commission" means the Hazardous Materials Information Review Commission established by the *Hazardous Materials Information Review Act (Canada).*

"container" includes a bag, barrel, bottle, box, can, cylinder, drum, storage tank, or similar package or receptacle.

"controlled product" means a product, material or substance specified by regulations made pursuant to section 15(1)(a) of the *Hazardous Products Act (Canada)* as products, materials and substances included in any of the classes listed in Schedule II of that Act.

"dust exposure occupation" means employment
- (1) in an asbestos mine, or
- (2) where a person is normally required to work more than 20% of his working time in any one month
  - (a) underground in a mine,
  - (b) in the mining activity of open pit and glory hole operations,
  - (c) in crushing plants, assay grinding rooms, or coal cleaning plants,
  - (d) in operations that involve dry milling or dry concentrating,
  - (e) in wet concentrating plants where the plant is not adequately separated from dry crushing plants, or
- (3) at other locations designated by the chief inspector

"employer" means owner, agent, or manager as defined in the *Mines Act.*

"hazard information" means information on the proper and safe use, storage, and handling of a controlled product and includes information relating to its toxicological properties.

"hazardous substance" means a substance which may be injurious to the health or safety of a worker.

"hazardous waste" means a substance which may be injurious to the health or safety of a worker.

"Label" includes a mark, sign, device, stamp, seal, sticker, ticket, tag or wrapper.

"manufactured article" means an article that is formed to a specific shape or design during manufacture, the intended use of which, when in that form, is dependent in whole or in part on its shape or design, and that under normal conditions of use will not release or otherwise cause a person to be exposed to a controlled product.

"material safety data sheet (MSDS)" means a document disclosing the information referred to in section 13(a)(i) to (v) of the *Hazardous Products Act (Canada)* and sections 9(2) of the Controlled Products Regulations (Canada).

"product identifier" means, in respect of a controlled product, the brand name, code name, or code number specified by a supplier of the chemical name, common name, generic name, or trade name.

"readily available" means, when used in connection with a material safety data sheet, available in a place where a person can easily access and study the information it contains.

"respirable combustible dust – RCD" means any dust which is respirable, and which is burned off when subjected to the procedure contained in the CANMET document number PROJ51/ADHOC90.18 which is obtainable from the, Mining Division or from CANMET.

"risk phrase" means, in respect of a controlled product or a class, division , or subdivision of controlled products, a statement identifying a hazard that may arise from the nature of the controlled product or the class, division, or subdivision of controlled products.

"supplier label" means a label provided by a supplier that complies with the requirements, discloses the information, and displays the hazard symbols referred to in section 12(b) of the *Hazardous Products Act (Canada)*, section 17 of the Controlled Products Regulations (Canada).

"supplier material safety data sheet" means a material safety data sheet provided by a supplier.

"threshold limit value – time weighed average (TLV-TWA)" means the time weighed average concentration for a normal 8 hour day and a 40 hour workweek, to which nearly all workers can be repeatedly exposed without adverse effect.

"threshold limit value – short term exposure limit (TLV – STEL)" means the concentration to which workers can be exposed continuously for a short period time, provided the daily TLV-TWA is not exceeded. It must be no longer than 15 minutes, be separated by at least 60 minutes if repeated, and occur no more than 4 times per day.

"threshold limit value – ceiling (TLV-C)" means the concentration that must not be exceeded during any part of the working exposure.

"workplace label" means a label that discloses a product identifier and information for the safe handling of a controlled product, and that indicates that a material safety data sheet, if supplied or produced, is available.

Workplace Contaminants

Maximum Allowable Exposures

2.1.1 Notwithstanding section 1.1.4 of the code, employees shall not be exposed to airborne concentrations of chemical agents or noise in excess of the levels specified in Tables 2-1 and 2-2, or where not specified those listed in the 1994-1995 edition of the American Conference of Governmental Industrial Hygienists' book entitled "Threshold Limit Values and Biological Exposure Indices". Referenced material shall be made available to the OHSC.

Shifts Longer Than 8 Hours

2.1.2 When shifts longer than 8 hours are being worked, the time-weighted average concentration of airborne contaminants shall be based on the "concentration equivalent" (Ceq) which is derived from the following formula:

$$\mathrm{Ceq} = \frac{(\text{8-hour TWA})\times 8}{\text{shift length in hours}}$$

Monitoring Contaminants

2.1.3 (1) The manager shall establish a written program, in accordance with the chief inspector's publication "Workplace Monitoring Procedures Manual" for a qualified person to monitor workplace contaminants as often as necessary to ensure compliance with section 2.2.1. The program shall specify the substances and locations to be monitored and the frequency of monitoring. The results of the program shall be available for examination by an inspector.

(2) A record of the monitoring program shall be kept on file for the life of the mine and transferred to the chief inspector upon abandonment of the mine.

Oxygen Content of Air

2.1.4 Persons shall not work or remain in any part of a mine where they may be exposed to air with an oxygen content less than 19.5% by volume unless provided with an alternate air supply.

Control of Workplace Hazards

Workplace to Be Hazard Free

2.2.1 The manager shall develop and implement an effective housekeeping program to ensure that all workplaces and travelways are maintained in a safe condition, that materials and equipment are stored in a manner so as not to endanger persons, and that appropriate action is taken whenever necessary to maintain a hazard-free environment.

2.2.2 An inspector may require the manager to satisfy him/her that it is not practicable to comply with section 1.9.1(2) with proper engineering controls, and the inspector shall communicate his decision to the OHSC.

Hazardous Materials & Waste

Asbestos Controls and Substitutes

2.3.1 The manager shall ensure that
(1) as effective, less hazardous, asbestos-free substitutes become available and practical for such items as brake lining, insulation, and fire retardant materials, they shall be used,
(2) where there is no substitute available for an asbestos-containing material, a procedure acceptable to the chief inspector is developed to protect the health of persons using, maintaining, or exposed to such material,
(3) notwithstanding subsection (2), items containing crocidolite asbestos are not to be used at a mine,
(4) spraying of asbestos, or material containing more than 1% of asbestos, is prohibited, and
(5) protective clothing and equipment made of material containing asbestos is used in such a manner as to prevent the release of asbestos fibers.

Disposal of Asbestos

2.3.2 Where any work involves the use, handling, or disposal of asbestos or materials containing asbestos, the manager shall ensure that the procedures outlined in the manual "Safework Practices for Handling Asbestos Revision 10 1996" published by the Board are followed, and that the inspector and the OHSC are notified of the procedures.

Storage of Hazardous Materials

2.3.3 The manager shall ensure that all dangerous or potentially hazardous materials are stored in designated storage areas, acceptable to an inspector, which are well ventilated to prevent any accumulation of dangerous fumes and so arranged that incompatible materials, which could produce a harmful reaction if combined, are adequately separated.

Proper Containers

2.3.4 The manager shall ensure that all dangerous or potentially hazardous materials are stored in containers that are designed, constructed, and maintained in such a manner as to ensure proper containment of their contents under the environmental conditions in which they are stored.

Hazardous Dust

2.3.5 In a building where dust or other material could by becoming airborne cause a hazard by restricting vision, or could cause a fire or explosion or be potentially hazardous if inhaled or ingested, it shall without delay be removed by suitable means such as vacuuming, wet sweeping, or wet shoveling, or be suppressed.

Hazardous Waste

2.3.6 Waste materials which could be detrimental to a person's health, or could cause a fire or explosion, shall be

(1) stored in impervious containers, labeled to clearly identify the contents and the nature of the hazard, and where the contents are flammable or capable of producing vapours or gases, the containers shall be covered and located in well-ventilated areas, and

(2) collected, handled, sorted, and disposed of by persons trained to safely handle the waste material and wearing any necessary protective clothing and equipment to safeguard their own and any other person's health and safety.

Spills 2.3.7 Spills or releases of hazardous waste materials shall be cleaned up as soon as possible by persons trained to safely handle the waste material and wearing any necessary protective clothing and equipment to safeguard their health and safety.

Flammable Waste Storage 2.3.8 Waste materials containing solvents, grease, paints, or other flammable substances shall be stored in appropriate covered containers while awaiting disposal.

Radiation 2.3.9 The manager shall
(1) ensure that equipment which emits harmful levels of infrared or ultraviolet radiation is shielded to protect employees from exposure to such radiation, and
(2) supply personal protective equipment to any person who could become exposed to harmful radiation levels and the person shall wear the protective equipment.

2.3.10 Notwithstanding section 1.1.4 of the code, the manager shall ensure that employees are not exposed to non-ionizing radiation which exceeds the recommendations contained in the publication "Safety Code 6, Recommended Safety Procedures for the Installation and Use of Radio Frequency and Microwave Devices in the Frequency Range of 10 MHz to 300 GHz", published by Health and Welfare, Canada.

2.3.11 (1) A worker shall not be exposed to ionizing radiation to a level greater than:

- (a) 4.0 Working Level Months (20 millisieverts) of radon decay products per year averaged over 5 years, and 10.0 Working Level Months (50 millisieverts) in a single year,
- (b) 20 millisieverts (2 Rem) of gamma radiation per year averaged over 5 years, and 50 millisieverts (5 Rem) in a single year, and
- (c) a combination of radon decay products and gamma radiation totaling 20 millisieverts averaged over 5 years or 50 millisieverts in a single year.

(2) Where measurements indicate a worker is exposed to gamma radiation greater than 5.0 microsieverts per hour (0.5 millirem per hour) at 0.5 meters from the source, a gamma radiation dosimeter of a type approved by the chief inspector shall be provided to and worn by each worker who is exposed.

(3) All radioactive materials shall be used, handled, stored, transported, and disposed of in accordance with the Canadian Nuclear Safety Commission Regulations.

Spraying of Materials Containing Isocyanates

2.3.12 Where paints, protective coatings, adhesives, or insulating materials containing isocyanate compounds or other compounds that have similar sensitizing effects are being applied, persons shall be protected from the airborne contaminants by

(1) where practicable, performing the work in an isolated enclosure having sufficient exhaust ventilation to ensure that contaminated air is not released from the enclosure into areas where unprotected persons can enter, and

(2) where methylene bisphenyl isocyanate is used, ensuring that a supplied-air respirator (SAR) approved by NIOSH or MSHA is worn by all exposed persons, in accordance with the following concentrations:

- (i) up to 2 mg/m^3: SAR or SCBA,
- (ii) up to 5 mg/m^3: SAR operated continuous flow, or SCBA,
- (iii) up to 10 mg/m^3: positive pressure, full-facepiece SAR,
- (iv) up to 100 mg/m^3: positive pressure, full-facepiece SCBA, and
- (v) emergency or planned entry into unknown concentrations or immediately dangerous to life or health: positive pressure, full-facepiece SCBA, or positive pressure full-facepiece SAR with an auxiliary positive pressure SCBA.

(3) A respirator type shall be selected in accordance with assigned protection factors as outlined in Table 2 of CSA Standard Z94.4-93

Harmful Chemical Exposure

Emergency Wash Facilities

2.4.1 Where persons may be exposed to corrosive or other chemicals harmful to the eyes or skin, the manager shall ensure that eye wash equipment, emergency water baths or showers, or other suitable means are immediately available to effectively cleanse the affected body areas.

(1) The emergency shower facility shall provide a tempered supply of potable water for a minimum of 15 minutes.

(2) In cases where it is not practical to install a permanent facility portable eye wash stations and/or portable emergency wash facilities may be installed as applicable.

(3) Provisions shall be taken to ensure that water supplies and eye wash isotonic fluids are protected from freezing and are adequately maintained.

Protection From Contaminants

2.4.2 (1) Where the nature of the work causes a person's clothing or skin to be contaminated with substances which could cause injury to, or endanger the health of, the person or contaminate other areas on or off the minesite, the manager shall provide

- (a) shower or wash facilities to enable employees to effectively remove all contaminants, and
- (b) separate storage areas for street and work clothing to prevent contamination of the street clothing.

(2) Where contaminated clothing is not to be removed from the minesite, the manager shall provide

- (a) a means for cleaning the contaminated clothing, or
- (b) suitable protective clothing.

(3) A person exposed to contaminants shall

- (a) cleanse any affected skin areas as soon as practicable,
- (b) not consume or handle food or tobacco products until his hands and face are free of contamination,
- (c) ensure that he removes contaminated clothing and disposes of it, and
- (d) not leave the mine at the end of his shift until all affected areas of his skin have been cleansed of contamination.

Abrasive Blasting

No Silica or Lead

2.5.1 Abrasive blasting material containing 1%, or more, free silica or lead shall not be used.

2.5.2 All abrasive blasting and similar operations, when carried out within a building, shall be conducted in an isolated enclosure to prevent injury to persons. The enclosures shall have sufficient exhaust ventilation to ensure that a continuous inward flow of air is maintained at all openings in the enclosure during the blasting operation.

2.5.3 All abrasive blasting and similar operations, when carried out outside a building, shall be conducted in a place and manner to prevent injury to persons.

Protective Equipment

2.5.4 (1) Where an abrasive blasting operation is being carried out, the manager shall supply and employees shall wear air-supplied hoods or respirators suitable for the work, together with gloves, leggings, and clothing designed to protect the employees from dust, and projected abrasive or other material.

(2) Air supplied to the hood or respirator shall meet the requirements of CSA Standard CAN3-Z180.1-M85 "Compressed Breathing Air and Systems," as updated from time to time, and the volume of air supplied shall be sufficient for respiration and to prevent the entry of contaminants into the hood or respirator, and shall not be less than 105 L per minute at the mask.

Nozzles and Valves

2.5.5 (1) Blast cleaning nozzles shall be equipped with an operating valve which must be held open manually, and the normal operation of this valve shall not be defeated. A support shall be provided on which the nozzle can be secured when not in use.

(2) In addition to the operating valve required by subsection (1), another operating control shall be readily accessible to the operator to enable the flow of abrasive to be stopped immediately.

Workers to be Removed

2.5.6 Where an abrasive blasting or a similar operation releases harmful substances to the atmosphere, persons who are not required to assist in the operation shall be removed from contaminated areas. Where such removal is not practical, the exposed persons shall be advised of the hazard and supplied with suitable personal protective equipment which they shall wear.

Noise

Mufflers Required

2.6.1 Any machinery or equipment which, when operating, exposes the operator or persons in the vicinity to noise levels in excess of those prescribed in Table 2-2, Part 2, for unprotected ears, shall, if practicable, be fitted with a properly maintained muffler or other noise reducing device.

Use of Lasers

Laser Standard

2.7.1 Where laser emitting devices are used, they shall be classified and used in accordance with the procedures outlined in ANSI Z136.1 - 1993 - "American National Standard for the Safe Use of Lasers".

Protection Required

2.7.2 Warning signs shall be posted and properly constructed screens or enclosures used wherever there could be a danger to any person from an inadvertent exposure to a laser beam.

Illumination

Lighting Standards

2.81 The manager shall ensure that at all working places, suitable and adequate illumination is provided meeting the standards set out in the ANSI/IES Standard RP-7-1991: "American National Standard Practice for Industrial Lighting", as updated from time to time, unless otherwise authorized by the code.

Surface Illumination

2.8.2 The manager shall ensure that there is a separate and independent emergency source of illumination at all places where a hazard could be caused by a failure of the normal lighting system, and the emergency lighting system shall
(1) where it is a part of a permanent installation, turn on automatically when the normal lighting fails,
(2) provide adequate illumination to allow employees to initiate emergency shutdown procedures and leave their work areas safely, and
(3) be tested as frequently as necessary to ensure that it will function when required.

Underground Illumination

2.8.3 The manager shall have suitable permanent lighting installed in an underground mine to provide adequate illumination in the following locations
(1) all workshops, service garages, and other places where moving machinery or equipment could be a hazard,
(2) main shaft stations and active shaft landings,
(3) first aid stations, and
(4) conveyor galleries, drives, and transfer stations.

Cap Lamps to be Provided

2.8.4 The manager shall provide every person entering an underground mine with an approved cap lamp and the person shall keep the lamp in his possession while he is underground.

Cap Lamps Specifications

2.8.5 All newly purchased cap lamps, and after January 1995 all cap lamps, shall be capable of providing a peak luminance of at least 1500 lux at 1.2 m from the light source, throughout a working shift.

2.8.6 The manager of an underground mine shall develop a procedure for assessing and maintaining cap lamps and a copy of the procedure and the results of the assessment shall be made available to an inspector.

Auxiliary Lighting

2.8.7 Where a person has to assess ground conditions in an underground mine at a distance greater than the effective range of a cap lamp, the manager shall supply, and the person shall use, auxiliary lighting adequate for safely carrying out the assessment.

Musculoskeletal Disorders

2.9.1 Where the equipment, work procedure, or working condition in a work area has caused injurious inflammation of muscles, tendons, or bursae of the upper limbs of the persons doing the work, and it is demonstrated to be from repetitive or forceful use, the chief inspector shall, where practicable, require implementation of one or more of the following preventive measures
(1) modification of work procedures or equipment to reduce physical demands on affected body areas, or
(2) a rescheduling or work to permit safe adjustment to unaccustomed task requirements.

Thermal Environment

Heat or Cold Stress

2.10.1 Where it is not reasonably practical to control thermal conditions, and the nature of the work can cause distress or illness to a person, the manager shall institute a program to
(1) instruct employees in the possible adverse effects of their working environment,
(2) instruct employees how to recognize symptoms of heat or cold stress and what emergency treatment should be applied, and
(3) monitor thermal conditions to identify when persons could be adversely affected by heat and cold stress, and if protective measures are required to adequately protect persons, he shall advise an inspector of the measures taken.

Lunchrooms & Sanitary Conveniences

2.11.1 The manager shall provide a source of cool, potable drinking water complying with the Safe Drinking Water Guidelines of the Ministry of Health in locations that
(1) are reasonably accessible to employees,
(2) are kept clean and in a sanitary condition, and
(3) are designed to permit the water to be dispensed and drunk in a sanitary manner.

Use of Solder

2.11.2 New installations of pipes and vessels, and changes to existing pipes and vessels which carry water to be used in whole or in part by persons for drinking purposes, shall not be constructed using solder containing more than 1% lead.

Lunchrooms

2.11.3 Where 7 or more persons regularly congregate to eat food, other than where the mining activity of an open pit mine is performed, a lunchroom shall be provided which shall:
(1) be heated, lighted, and ventilated,
(2) have or be located near facilities for persons to wash with cold and hot running water and dry their hands,
(3) not have an entrance through a toilet facility,
(4) contain sufficient fire retardant receptacles with lids, which shall be used by employees to dispose of all waste food, paper, and other related material, and the containers shall be emptied regularly,
(5) have suitable seating facilities equipped with backrests and tables with impervious top surfaces which shall be kept in clean and sanitary condition,
(6) be constructed of materials which can be, and shall be, maintained in a clean condition.

(7) have the following minimum dimensions

No. of Persons	sq. m/Person
25 or less	1.2 (min. size 6 sq.m.)
26 to 74	1
75 to 149	0.66
150 to 499	0.56
500 or more	0.46

and

(8) be located in an area away from process chemicals and contaminants.

2.11.4 Where more than 3 persons and fewer than 7 persons regularly congregate to eat food, other than where the mining activity at an open pit mine is performed, an eating area shall be provided which complies with 2.11.3. (1), (4), (5), (6), (7), and (8), and provided with facilities for persons to clean their hands.

Mine Dry

2.11.5 (1) The manager shall provide separate facilities for male and female employees to wash and shower, and to change and dry their clothing

- (a) at a surface mine where persons are subject to dusty, dirty, or wet conditions, and
- (b) at an underground mine, and this facility shall include separate storage facilities for street clothes and working clothes.

(2) The facilities shall have separate approaches with signs clearly indicating for which gender they have been provided.

Location of Mine Dry

2.11.6 A mine dry shall not be located

(1) in a headframe, boiler room, engine room, bunkhouse, or dining room unless a separate, properly constructed room is provided, or

(2) nearer than 15 m to a shaft house or portal house unless it is constructed of non-combustible materials.

2.11.7 The mine dry shall be adequately heated, lighted and ventilated, kept clean and sanitary, and have one shower for every 7 persons leaving work at the same time.

Temperature of Washing Water

2.11.8 Water that is to be used for personal washing shall not exceed 60 degrees Celsius at any outlet, and shall not be mixed directly with steam.

Toilet Facilities

2.11.9 The manager shall provide separate toilet facilities for male and female employees, having separate entrances with signs clearly indicating for which gender they have been provided.

2.11.10 On the surface of a mine, the manager shall provide washroom facilities that are conveniently located and equipped with:
(1) one toilet and one urinal for every 25 male employees or fraction thereof, and one toilet for every 9 female employees or fraction thereof, except where the maximum number of employees on any shift is fewer than 6 when one toilet is required,
(2) one wash basin, or equivalent facility, provided with hot and cold running water for every 15 employees or fraction thereof,
(3) a means for drying hands hygienically, and
(4) adequate heat, light, and ventilation.

2.11.11 For the purposes of section 2.11.10
(1) each 600 mm of straight trough urinal may be counted as one urinal, and
(2) each 500 mm of circumference of a circular wash fountain or length of a straight trough wash basin may be counted as one wash basin.

Toilets

2.11.12 A toilet on the surface of a mine shall be
(1) of the water flushing type or other sanitary design, located in an individual compartment with a door that locks, and with walls and floor of a finish or material that can be easily cleaned.

(2) fitted with an open-front seat and provided with a reasonable supply of toilet paper,
(3) provided with a clothes hook and lighting where electricity is available, and
(4) kept clean and sanitary, and any waste products shall be disposed of regularly.

Toilets Underground or Portable on Surface

2.11.13 Toilets in an underground mine and portable toilets on surface shall be conveniently located in well ventilated areas having regard to the number of employees in the various parts of the mine, and
(1) they shall be supplied with toilet paper and provide privacy,
(2) be maintained in a hygienic condition and have all waste material removed regularly, and
(3) be equipped with facilities for persons to clean their hands.

2.11.14 No person shall deposit feces in any place in an underground mine other than a toilet.

Seasonal Camps

2.11.15 Sanitary conveniences at seasonal, short-term mining camps shall comply with the Industrial Camps Health Regulations under the *Health Act*.

Medical Surveillance Programs

Program Requirements

2.12.1 (1) The manager shall notify the chief inspector when he believes there is a need for a medical surveillance program, for persons
- (a) in a dust exposure occupation,
- (b) exposed to excessive noise, or
- (c) exposed to any chemical, physical, or radiation agent specified by the chief inspector.

(2) A medical surveillance program, when required by the chief inspector, shall be modeled after the "Guidelines for Standard Practice for Medical Monitoring Programs" issued by the chief inspector and shall be of a form satisfactory to him.

Audiometric Testing

2.12.2 Audiometric testing shall be carried out by a certified audiometric technician.

2.12.3 (1) The manager shall advise persons working in a dust, excessive noise, chemical, physical, or radiation exposure occupation, of the nature of the health risks and that a medical surveillance program is available, and the person, at his option, may choose to participate in the program.

(2) A person participating in the medical surveillance program may attend the doctor of his choice to undergo the examinations and tests required by 2.12.1 (2).

Medical Advice

2.12.4 A medical surveillance program, required by section 2.12.1, shall ensure that

(1) Each person examined or clinically tested is

- (a) aware of the nature of the health risks and effects for which he is being examined,
- (b) advised on his medical fitness to work,
- (c) advised of any work restriction resulting from his medical condition,
- (d) instructed in health precautions required, and
- (e) provided with a copy of the results of the medical examination.

(2) A hearing conservation program is developed and followed.

Maintenance of Records

2.12.5 (1) Personal medical records shall be maintained on a confidential basis by the physician or nurse, and shall not be made available to the manager or any other person, except as required by statute, without the informed written consent of the individual.

(2) Audiometric information shall be made available to the chief inspector.

Chemical Analysis **2.12.6** Whenever a chemical analysis is required for biological monitoring it shall be carried out at a laboratory acceptable to the chief inspector.

Programs at Owner's or Agent's Expense **2.12.7** All medical examinations and tests performed on a person during a medical surveillance program, shall be done at the owner's or agent's expense and the expense shall not be passed on to that person.

Workplace Hazardous Materials Information Systems (WHMIS)

Application **2.13.1** (1) This section applies to employers and employees in respect of controlled products used, stored, or handled at a mine.

(2) Notwithstanding subsection (1), the provisions of this code in respect of a supplier label and a material safety data sheet do not apply where the controlled product is an

(a) explosive within the meaning of the *Explosives Act* (Canada),
(b) cosmetic, device, drug or food within the meaning of the *Food and Drug Act* (Canada),
(c) controlled product within the meaning of the *Pest Control Products Act* (Canada),
(d) prescribed substance within the meaning of the *Atomic Energy Control Act* (Canada), or
(e) product, material, or substance packaged as a consumer product and in quantities normally used by the consuming public.

(3) Notwithstanding subsection (1), this code does not apply where the controlled product is

(a) wood or a product made of wood,
(b) tobacco or a product made of tobacco,
(c) a manufactured article, or
(d) being transported or handled pursuant to the requirements of the *Transportation of Dangerous Goods Act* (Canada) or the *Transport of Dangerous Goods Act*.

(4) Notwithstanding subsection (1), this code does not apply to a hazardous waste except that the manager shall ensure the safe storage and handling of a hazardous waste generated at that mine through the combination of any mode of identification and employee education.

Use, Storage, Handling

2.13.2 (1) The manager shall ensure that a controlled product is not used, stored, or handled in a mine, unless all the applicable requirements of this code in respect of labels, identifiers, material safety data sheets, and employee education are complied with.

(2) Notwithstanding subsection (1), the manager may store a controlled product in a mine while actively seeking information required by this code.

Worker Education

2.13.3 (1) The manager shall ensure that a person who works with a controlled product or in proximity to a controlled product is informed about all hazard information received from a supplier concerning that controlled product as well as any further hazard information of which the manager is aware or ought to be aware concerning the use, storage, and handling of that controlled product.

(2) Where a controlled product is produced in a mine, the manager shall ensure that a person who works with that controlled product or in proximity to that controlled product is informed about all hazard information of which the manager is aware or ought to be aware concerning that controlled product and its use, storage, and handling.

Worker Training

2.13.4 (1) The manager shall ensure that a person who works with a controlled product or in proximity to a controlled product is instructed in

- (a) the content of the applicable supplier label and workplace label, and the purpose and significance of the information contained on the label,

(b) the content required on a material safety data sheet and the purpose and significance of the information contained on the material safety data sheet,
(c) procedures for the safe use, storage, handling, and disposal of a controlled product,
(d) the safe use, storage, handling, and disposal of a controlled product contained or transferred in
  (i) a pipe,
  (ii) a piping system including valves,
  (iii) a process vessel,
  (iv) a reaction vessel, or
  (v) a tank car, tank truck, ore car, conveyor belt, or similar conveyance.
(e) procedures to be followed where the controlled product escapes from equipment or from another product, and
(f) procedures to be followed in case of an emergency involving a controlled product.

(2) The manager shall ensure that the program of employee education required by section 2.13.4(1) is developed and implemented
(a) for that mine and related to the manager's program for the prevention of injuries and occupational disease, and
(b) in consultation with the occupational health and safety committee.

(3) The manager shall ensure, so far as is reasonably practicable, that the program of employee instruction required by section 2.13.4(1) results in a person being able to apply the information as needed to protect his health and safety.

(4) The manager shall review at least annually, or more frequently if required by a change in work conditions or available hazard information, and in consultation with the joint Occupational Health and Safety Committee, the instruction and training provided to employees concerning controlled products.

Supplier Label **2.13.5** (1) The manager shall ensure that the container of a controlled product or a controlled product received at a mine is labeled with a supplier label.

(2) Subject to subsection (3) and to subsection 2.13.15, as long as any amount of a controlled product remains in a mine in the container in which it was received from the supplier, the manager shall not remove, deface, modify, or alter the supplier label.

(3) Where a label applied to a controlled product or a container of a controlled product becomes illegible or is accidentally removed from the controlled product or the container, the manager shall replace the label with either a supplier label or a workplace label.

(4) A manager who has received a controlled product in a multi-container shipment, where the individual containers have not been labeled by the supplier, shall apply to each container a label that meets the requirements of the Controlled Products Regulations (Canada).

(5) Where the controlled product imported under section 23 of the Controlled Products Regulations (Canada) is received at the mine without the supplier label, the manager shall apply a label that meets the requirements of that regulation.

(6) A manager who has received a controlled product transported as a bulk shipment shall

(a) apply a supplier label to the container of the controlled product or to the controlled product at the mine, or

(b) where, pursuant to Section 15 of the Controlled Products Regulations (Canada) the supplier is not required to label a controlled product transported as a bulk shipment, the manager shall apply a workplace label to the container of a controlled product or to the controlled product at the mine.

Workplace Label for Employer Produced Products

2.13.6 (1) Where a process produces a controlled product at a mine, the manager shall ensure that the controlled product or the container of the controlled product has applied to it a workplace label.

(2) For purposes of subsection (1), "produces" does not include the production of a controlled product that escapes from equipment or from another product.

(3) Subsection (1) does not apply when the controlled product is in a container that is intended to contain the controlled product for sale or distribution and the container is, or is about to be, appropriately labeled.

Workplace Label for Decanted Products

2.13.7 (1) Where a controlled product in a mine is in a container other than the container in which it was received from a supplier, the manager shall ensure that the container has applied to it a workplace label.

(2) Subsection (1) does not apply to a portable container that is filled directly from a container that has applied to it a supplier label or workplace label

- (a) If the controlled product:
  - (i) is under the control of and is used exclusively be the worker who filled the portable container,
  - (ii) is used only during the shift in which the portable container was filled, and
  - (iii) the content of the container is clearly identified, or
- (b) if all of the controlled product is required for immediate use.

Identification of a Controlled Product in Piping Systems and Vessels

2.13.8 Where a controlled product in a mine is contained or transferred in a pipe, a piping system including valves, a process vessel, a reaction vessel, or a tank car, tank truck, ore car, conveyor belt, or similar conveyance, the manager shall ensure the safe use, storage, and handling of the controlled product through employee education and the use of colour coding, labels, placard, or any mode of identification.

Placard Identifiers

2.13.9 Notwithstanding sections 2.13.5, 2.13.6 and 2.13.7 where the controlled product is not in a container, or in a container in a form intended for export, the manager may fulfill the labeling requirements under sections 2.13.5, 2.13.6 and 2.13.7 by posting a placard which:
(1) discloses the information required for a workplace label, and
(2) is of a size and in locations so that the information is conspicuous and clearly legible to employees.

Laboratory Label

2.13.10 (1) A label of a container for a controlled product that originates from a laboratory supply house and is packaged in quantities of less than 10 kg for each container and that is intended for use in a laboratory shall disclose

- (a) a product identifier,
- (b) where a material safety data sheet is available, a statement indicating that fact, and
- (c) the following information that is applicable to the product: risk phrases, precautionary measures, or first aid measures.

(2) Notwithstanding section 2.13.7(2), the manager shall ensure that the contents of a container of a controlled product are clearly identified on the container where

- (a) the container is not the container in which the controlled product was received from the supplier, and
- (b) the manager intends to use the controlled product, or it is in the normal course of his business, used exclusively in a laboratory.

(3) The manager shall ensure that a controlled product undergoing analysis, tests, or evaluations in a laboratory is clearly identified.

Supplier Material Safety Data Sheets

2.13.11 (1) A manager who acquires a controlled product for use at a mine shall obtain a supplier material safety data sheet in respect of that controlled product.

(2) Where a supplier material safety data sheet obtained under subsection (1) in respect of a controlled product is 3 years old, the manager shall, if possible, obtain from the supplier an up-to-date supplier material safety data sheet in respect of any of the controlled product that remains at the mine.

(3) Where the manager is unable to obtain a material safety data sheet as required by subsection (2), the manager shall add any new hazard information applicable to that controlled product to the existing supplier material safety data sheet on the basis of the ingredients disclosed in that document

(a) the manager may provide a material safety data sheet in a format different from the format provided by the supplier or containing additional hazard information, if the material safety data sheet provided by the manager

(b) subject to section 2.13.15, includes at least the content of the supplier material safety data sheet, and

(c) indicates that the supplier material safety data sheet is available at the mine.

(4) Where a supplier is exempted under section 9 or 10 of the Controlled Products Regulations (Canada) from the requirement to provide a material safety data sheet for a controlled product, the manager is exempt from the requirement to obtain and provide a material safety data sheet for that controlled product.

(5) Where a controlled product is received at a laboratory and the supplier has provided a material safety data sheet, the manager shall ensure that a copy of the material safety data sheet is readily available to the employees in the laboratory.

(6) Where a controlled product is received or produced at a laboratory and the manager has produced a material safety data sheet, the manager shall ensure that the material safety data sheet is readily available to employees in the laboratory.

Employer Material Safety Data Sheets

2.13.12 (1) Where a process produces a controlled product in the mine, the manager shall prepare a material safety data sheet in respect of the product which discloses, subject to section 2.13.15, the information required under the Controlled Products Regulations (Canada).

(2) For the purpose of subsection (1), "produces" does not include the production of a controlled product that escapes from equipment or from another product, nor does it include intermediate products undergoing reaction within a reaction or process vessel.

(3) The manager shall update the material safety data sheet referred to in subsection (1)

- (a) as soon as practicable after new hazard information becomes available to the manager, and
- (b) at least every 3 years.

Availability of a Material Safety Data Sheet

2.13.13 (1) The manager shall ensure that a copy of a material safety data sheet required by sections 2.13.11 or 2.13.12 is made readily available at the mine to the occupational health and safety committee and persons who may be exposed to the controlled product.

(2) Notwithstanding subsection (1), when the manager is required by subsection (1) to make a material safety data sheet readily available, the material safety data sheet may be made available on a computer terminal if the manager

- (a) takes all reasonable steps to keep the terminal in active working order,
- (b) makes the material safety data readily available on the request of a person, and
- (c) provides training in accessing computer stored material safety data sheets to
  - (i) one or more employees working at a mine where the material safety data sheet is available on a computer terminal, and
  - (ii) members of the occupational health and safety committee.

Deletions From a Material Safety Data Sheet

2.13.14 Where a manager claims an exemption under section 2.13.15, the manager may delete the information that is the subject of the claim from the material safety data sheet provided under sections 2.13.11 and 2.13.12 for the time period in subsection 2.13.15 (4), but may not delete hazard information.

Confidential Business Information

2.13.15 (1) An employer who is required by this code to disclose on a label or a material safety data sheet

- (a) the chemical identity or concentration of an ingredient of a controlled product,
- (b) the name of any toxicological study that identifies an ingredient of a controlled product,
- (c) the chemical name, common name, generic name, trade name, or brand name of a controlled product, or
- (d) information that could be used to identify a supplier of a controlled product

may, if the manager considers such information to be confidential business information, claim an exemption from the requirement to disclose that information.

(2) The claim under subsection (1) shall be made to the commission established under the *Hazardous Materials Information Review Act (Canada)* and shall be filed in accordance with the procedure established under that act and the regulations made under it.

(3) Under section 32 of the *Hazardous Materials Information Review Act (Canada)*, the commission shall exercise the powers and perform the functions specified in that act and the procedures prescribed by regulations under that act in respect of a claim made under subsection (1).

(4) Information that the manager considers to be confidential business information is exempt from disclosure from the time a claim is filed under subsection (1) until the claim is finally determined by the commission and for a period of 3 years after that if the claim is found to be valid.

(5) The manager who makes a claim under subsection (1) shall abide by decisions of the commission and orders of the commission.

(6) Appeals from decisions made by the commission under this section may be made under and in accordance with the provisions of the *Hazardous Materials Information Review Act (Canada)* and any regulations made under that act.

Confidentiality of Information **2.13.16** (1) Where a person enforcing this code obtains information from the commission under section 46 (2) (e) of the *Hazardous Materials Information Review Act* (Canada), the person to whom the information is communicated shall keep it confidential and shall not disclose such information to any person except for the purposes of enforcement of this code.

(2) A person to whom information is disclosed pursuant to subsection (1) shall keep the information confidential.

Disclosure in Medical Emergencies **2.13.17** (1) The manager shall, in respect of a controlled product that is or was present in the mine, provide information respecting the controlled product, including confidential business information in the possession of the employer, to

(a) a member, in good standing, of the College of Physicians and Surgeons of British Columbia, or

(b) a person registered or licensed under the *Nurses (Registered) Act*, the *Nurses (Registered Psychiatric) Act* or the *Nurses (Licensed Practical) Act* and authorized to practice nursing in British Columbia,

who requests information on the controlled product for the purpose of making a medical diagnosis of, or rendering medical treatment to, a person who used, handled, or was exposed to the controlled product at a mine.

(2) No person to whom information is provided by an employer pursuant to subsection (1) shall communicate or disclose the information to any other person except as may be necessary for the purposes mentioned in that subsection.

(3) A person to whom information is disclosed under subsection (2) shall keep the information confidential.

Prohibition Against Disclosure

2.13.18 No person shall use, disclose, or release information protected as confidential business information under this code except as provided by sections 2.13.16 and 2.13.17.

2.13.19 The manager shall ensure that persons who work with, or in the proximity of, a controlled product or a product described in section 2.13.20, shall comply with the procedures for the safe storage, handling, and use of those products, including the wearing of suitable personal protective equipment, as described in the material safety data sheet for those products.

2.13.20 Notwithstanding section 2.13.1, where persons who work with a substance, or in the proximity of a substance, which is not a controlled product and which substance could cause adverse health effects to those persons, then the manager shall comply with sections 2.13.3, 2.13.4, 2.13.5, 2.13.6, 2.13.7, 2.13.8, 2.13.9 and 2.13.10 as if the substance is a controlled product.

Table 2-1

	TWA		STEL	
Substance [CAS #]	**ppm**	**mg/m^3**	**ppm**	**mg/m^3**
Acetone [67-64-1]	750	1,780	1,000	2,380
Ammonia [7664-41-7]	25	17	35	24
Asbestos (d) Amosite [12172-73-5] Chrysotile [12001-29-5] Crocidolite [12001-28-4] Other Forms Where type of fiber has not been identified	 0.5 fibre/cc, A1 1 fiber/cc, A1** 0.2 fiber/cc, A1 1 fiber/cc, A1 ** 0.2 fibers/cc, A1 **			
Carbon dioxide [630-08-0]				
Carbon monoxide [630-08-0]	25	29	-	-
Chlorine [7782-50-05]	0.5	1.5	1	3
Coal Dust	-	2,(f) Respirable fraction		
Formaldehyde [50-00-0]	1,A2	1.5,A2	2, A2	3,A2
Hydrogen chloride [7647-01-0]	-	-	C5	C7.5
Hydrogen cyanide [74-90-8] Skin	C10	C10		
Hydrogen sulfide [7783-06-04]	10	14	15	21
Lead [7439-92-1] inorg. dusts and fumes, as Pb	-	0.15		
Methane [74-82-8]	*D*			
Methylene bisphenyl isocyanate (MDI) [101-68-81]	0.005	0.055	-	-
Nitric acid [7697-37-2]	2	5	4	10
Nitric oxide [10102-43-9]	25	30	-	-
Nitrogen dioxide [10102-44-0]	3	6	5	10
Nitrous oxide [10024-97-2]	50	90	-	-
Ozone [10028-15-6]	C(0.1)	C(0.2)		
Respirable combustible dust (RCD) **	-	1.5	-	-

Table 2-1(*continued*)

	TWA		STEL	
Substance [CAS #]	**ppm**	**mg/m^3**	**ppm**	**mg/m^3**
Silica – Amorphous				
Diatomaceous earth (uncalcined) [61790-53-2]	-	10(e)	-	-
Precipitated silica [112926-00-8]	-	10(e)	-	-
	-		-	-
Silica gel	-	10(e)	-	-
Silica, fume [69012-64-2]		2(j)		
Silica – Crystalline				
Cristobalite [14464-46-11]	-	0.05, (j)	dust	
Quartz [14808-60-7]	--	0.1Respirable	dust	
Silica, fused [606676-86-01]	0.1	0.1, (j)	dust	
Sulphur dioxide [7446-09-5]	2	5	5	10
Sulphuric acid [7664-93-9]	-	1	-	3
Toluene [108-88-3]	100	375	150	560
Welding fumes (NOC+)	-	5, B2		
Wood dust (certain hard woods as beech and oak)	-	1		
Soft wood	-	5	-	10

From American Conference of Governmental Industrial Hygienists, Inc., 1994 - 1995 Threshold Limit Values and Biological Exposure Indices Reprinted with permission.

ppm means parts of vapor or gas per million parts of contaminated air volume at 25 degrees Celsius and 760 torr.

mg/m^3 means milligrams of substance per cubic meter of air. When entry is in this column only, the value is exact; when listed with a ppm entry, it is approximate.

CAS means Chemical Abstract Series number.

Capital Letters A,B, D & E refer to Appendices; C denotes ceiling limit.

** Not ACGIH

+NOC Not otherwise classified

o STEL deleted, TWA retained

(d) Fibers longer than 5 µm and with an aspect ratio equal to or greater than 3.1 as determined by the membrane filter method at 400-450X magnification (4-mm objective) phase contrast illumination.
(e) The value is for total dust containing no asbestos and < 1% free silica.
(f) The value is for dust containing <1% free silica. For dust containing more than this percentage of free silica, the environment should be evaluated against the TLV_TWA of 0.1 mg/m^3 for respirabel quartz. The cncentration of respirable dust for the application of this liomit is to be determined from the fraction passing a size selector, with the characteristics defined in the "c" paragraphs of Appendix E.
(g) Lint free dust as measured by the vertical elutriator cotton-dust sampler described in the transactions of the National Conference on Cotton Dust, p 33, by J.R.. Lynch (may 2, 1970)
(h) Total particulate
(i) The concentration of respirable dust for the application of this limit is to be determined from the fraction passing a size-selctor with the characteristics defined in "c" paragraph of Appendix E.
(k) Based on high volume sampling.
(l) However, should not exceed 2 mg/m^3 respirable dust.
(m)For control of general room air, biologic monitoring is essential for personnel control.
(n) Does not include stearates of toxic metals.
(o) Except caster, cashew nut, or similar irritating oils.

Table 2 - 2

Maximum permissible noise exposure for unprotected ears on a daily basis:
Lex = 85 dBA average for 8 hours, or equivalent, including peak impulse noise except

(a) no exposure to steady state noise over 109 dBA, and
(b) no exposure to peak impulse noise over 140 dBA,

where:

1. "Lex" is the equivalent of 85 dBA for 8 hours (see examples below).
2. "Steady state noise" means noise in which variations of peak pressure levels are one second or less, and
3. "Peak Impulse" means noise in which variations of peak pressure levels are greater than one second apart.

Examples of equivalent levels to 85 dBA for 8 hours:

Length of Exposure	Average Noise Level
16 hours	82 dBA
12 hours	83 dBA
10 hours	84 dBA
8 hours	85 dBA
4 hours	88 dBA
2 hours	91 dBA
1 hours	94 dBA
½ hours	97 dBA
¼ hours	100 dBA

Table 2 - 3

Maximum Equivalent Noise Level, dBA	Required Rating of Hearing Protector	
	Class A, B or C †	**NRR ‡**
Leq less than 85 dBA	None required	None required
Leq up to 89 dBA	Class C	up to 16
Leq up to 95 dBA	Class B	at least 17
Leq up to 105 dBA	Class A	at least 24
Leq up to 110 dBA	Class A plug plus Class A or B muff	At least 24 plug plus At least 17 muff
Leq more than 100 dBA	As above, with limited exposure	As above, with limited exposure

† Canadian Standards Association standard Z94.2-94.

‡ Noise Reduction Rating (NRR) subject to Canadian Standards Association standard Z94.2-94 frequency requirements.

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PERSONNEL SAFETY

Definitions

"Confined Space" Means a tank, process vessel, underground vault, tunnel, or other enclosure not designed or intended for human occupancy. A person would enter it only if there was work to be done.

Impairment and Conduct

Impaired Persons

3.1.1 No person shall enter, remain, or be knowingly permitted to enter or remain in any mine if, in the opinion of management, his ability is so impaired as to endanger his health or safety, or that of another person

Drugs and Liquor

3.1.2 No person shall possess intoxicating liquor, or illegal drugs in or about a mine.

Improper Conduct

3.1.3 No person shall engage in any improper or foolhardy behavior such as horseplay, scuffling, fighting, playing practical jokes, or other conduct that might create or constitute a hazard to himself or any other person.

Tampering with Safety Devices and Equipment

3.1.4 No person shall, without cause, render ineffective any device, equipment, or material provided for the protection of the health and safety of persons employed in, on or about a mine, or the safety of the public.

General Safety Rules

Age

3.2.1 The manager shall not employ any person under the age of 18 years at a mine except for the purpose of training that person.

Tallying **3.2.2** (1) The manager shall implement a system to account for all persons on the mining property.

(2) A written copy of the system implemented, in accordance with 3.2.2(1) shall be made available to an inspector on request.

Working Alone **3.2.3** When a worker is working alone and may not be able to secure assistance in the event of an injury or other misfortune, the manager shall ensure that a means exists for checking the well-being of the worker and that the interval between checks does not exceed 2.5 hours.

Transportation of Persons **3.2.4** (1) No person shall be transported in the box of a pickup truck, and no person shall ride in a standing position.

(2) No person shall board or leave any vehicle while that vehicle is in motion.

Working Conditions

Hazardous Work **3.3.1** The manager or a person authorized by him shall personally supervise all work involved in correcting an unusual hazard and such work shall be carried out in accordance with safe working practices and in compliance with this code, and a plan approved by the manager.

Falling Objects **3.3.2** No persons shall be allowed in any location at a mine where persons are working overhead unless adequate protection is provided for their safety.

Water Hazard **3.3.3** When persons are required to work or be near water, where drowning could be a risk

(1) the manager shall provide, at conspicuous locations, life-buoys equipped with heaving lines of adequate length which conform with Ministry of Transport (Canada) standards, and

(2) if the person is required to work alone at these sites or be transported across water that person shall be provided with and shall wear a personal flotation device conforming to Canadian Government Specifications Board Standard CAN/CGSB-65.7-M88.

Moving Machinery and Electrical Contact

3.3.4 Where there is a risk of a worker coming into contact with moving parts of machinery or with electrically energized equipment, or where the work process is such that a similar hazard exists
(1) the clothing of the workers shall fit closely about the body,
(2) dangling neckwear, bracelets, wrist-watches, rings, or similar articles shall not be worn,
(3) the wearing of medic-alert bracelets is permitted when such bracelets are used with transparent rubber band that fit snugly over the bracelets, and
(4) cranial and facial hair shall be confined, or worn at a length which will prevent it from being snagged or caught in the work process.

Materials Handling

3.3.5 Where a materials handling task endangers the safety of the persons doing the work, the manager shall ensure that
(1) the physical parameters of the handling task are redesigned, or
(2) mechanical lifting aids or personal protective equipment is provided, or
(3) the work area where the work is carried out is redesigned to eliminate unsafe condition relating to floor surfaces, lighting, or obstruction to materials handling, or
(4) a combination of (1), (2), or (3) is implemented.

Hazardous Atmosphere - Confined Space

Work in Confined Spaces

3.4.1 The manager shall ensure that written procedures are developed and implemented for work in confined spaces where irrespirable, toxic or flammable atmospheres might be encountered.

Safe Work Procedures to Include

3.4.2 The procedures required under section 3.4.1 shall include

(1) the use of lifelines and safety belts whenever possible,

(2) when lifelines and safety belts cannot be used, sufficient resources with respiratory equipment capable of performing a rescue shall be stationed outside the confined space,

(3) maintenance of an effective means of communication between persons inside and outside the confined space,

(4) specified time intervals for making periodic visual contact with persons inside the confined space,

(5) specific procedures to be followed whenever welding or burning operations are to be carried out in the confined space,

(6) appropriate breathing apparatus and persons trained in its use, and readily available at every confined space in which persons are working,

(7) compressed air used for breathing complying with the requirements of CSA Standard CAN-3-Z180.1-M85 Series, and

(8) disconnection, blanking or blinding off pipes carrying substances that could be hazardous to the persons entering the confined space.

Test of Confined Space

3.4.3 A person without self-contained breathing apparatus shall not enter a confined space in which a harmful atmosphere might exist or develop until

(1) tests have been made to determine the nature and quantity of harmful vapours, gases, fumes, mists, dusts, and the oxygen content of the atmosphere inside the confined space and these test results shall be recorded in a logbook kept for that purpose,

(2) the written work procedures under section 3.4.1 have been read and understood by the person and the required emergency and rescue procedures are in place, and

(3) the confined space is being ventilated continuously by a natural or forced ventilation system.

Test of Intervals **3.4.4** Tests of the atmosphere inside the confined space shall be made at intervals during the work process to ensure that the quality of the air does not deteriorate and the test results shall be recorded as required by section 3.4.3(1).

Confined Space Ventilation **3.4.5** Where tests made under 3.4.3 and 3.4.4 or any other test or examination indicates a harmful atmosphere or the presence of a harmful substance, the confined space shall be ventilated or cleaned, or both, and re-tested or re-examined to ensure that no person without self-contained breathing apparatus is allowed to enter the confined space unless

(1) the atmosphere or substance in the confined space is no longer considered harmful according to the acceptable standards prescribed in part 2 of the code, and

(2) the oxygen content of the atmosphere inside the confined space is not less than 18%.

Wearing of Protective Equipment **3.4.6** Where tests under sections 3.4.3 and 3.4.4 indicate the presence of harmful or explosive substances and it is not practical to provide a safe, respirable atmosphere

(1) the persons entering the confined space shall wear self-contained breathing apparatus and personal protective equipment,

(2) the concentration of flammable substances shall be maintained below 20% of the lower explosive limit as determined by repeated testing, and

(3) all possible sources of ignition shall be eliminated or controlled where flammable substances exist.

Fire Prevention

Open Flame Underground

3.5.1 No person shall
(1) light or build a fire in an underground mine, or
(2) weld, cut by the use of heat or flame, or use a blowtorch in an underground coal mine without the written permission of the chief inspector, and
(3) the manager of an underground coal mine may submit for approval by the chief inspector a procedure for cutting and welding underground, and once this procedure is approved need only notify an inspector for future cutting and welding within the parameters of the approval.

Prohibited Articles

3.5.2 No person shall possess while underground in a coal mine or in any part of a mine designated by the manager
(1) a match or apparatus of any kind for creating an open flame or spark except as it exists in a flame safety lamp, or
(2) cigarettes, cigars, or smoking materials in any form.

Designation of Fire Hazard Areas

3.5.3 Fire hazard areas shall be identified by warning signs, and persons shall not smoke, use open flame lamps, matches, or other means of producing heat or fire in designated fire hazard areas.

Industrial First Aid

First Aid Supplies

3.6.1 The manager shall provide and maintain first aid supplies and services as required by the Workers Compensation Board.

3.6.2 An inspector may order an increase in the first aid supplies or services required by section 3.6.1

Means of Communication

3.6.3 The manager shall provide a means of communication acceptable to an inspector by which the services of a physician can be obtained expeditiously.

Mine Rescue

Mine Emergency Response Plan

3.7.1 The manager shall develop and file with the chief inspector, a mine rescue emergency response plan which shall be kept up to date and followed in the event of a emergency. The mine Emergency Response Plan shall contain all of the elements required in the "Mine Emergency Response Plan Guidelines for the Mining Industry," that may be amended from time to time.

Underground

3.7.2 The manager shall establish and maintain trained and equipped mine rescue teams at underground mines as specified in this section

(1) where the number of employees underground at one time is less than 50, but greater than 10, 1 team,

(2) the number of employees underground at one time is greater than 50, 2 teams, and

(3) on every shift where there are less than 20 working underground at any one time there are 3 persons trained in mine rescue.

Underground Mine Rescue Less Than 10

3.7.3 At underground operations employing less than 10 persons underground at one time the manager shall

(1) maintain on site such trained personnel, and equipment to provide a first response and assessment capability, and

(2) establish mutual aid agreements with outside groups, capable of providing additional trained personnel and equipment.

Surface at Underground Mine

3.7.4 At all underground mines where a surface fire can compromise people, plant, or equipment the manager shall ensure sufficient trained personnel and equipment are available to provide fire suppression capability for the site.

Open Pit

3.7.5 The manager of an open pit mine employing more than 25 persons per shift shall ensure that
(1) there is one fully trained and equipped mine rescue team, and
(2) on every shift where more than 10 persons are working, there are four persons trained in mine rescue procedures.

Team Complement

3.7.6 The normal compliment of a mine rescue team shall be 6 qualified members, one of whom shall be the team captain, one the vice captain, and one the coordinator who shall remain at the fresh air base at all times.

Mine Rescue Teams

3.7.7 A person shall not be considered as a qualified member of a mine rescue team unless
(1) possessing a valid mine rescue certificate and a valid St. John "Standard" first aid certificate, or equivalent,
(2) free from a beard, moustache, or sideburns that could interfere with the facepiece seal of any breathing apparatus,
(3) considered competent to act as a mine rescue team member by the person appointed as a trainer under section 3.7.9, and
(4) medically fit for the nature of the work required.

Mine Rescue Records

3.7.8 The manager shall ensure a record of all mine rescue training is maintained at the mine site, and shall
(1) ensure the logbook is maintained by the qualified person appointed by the manager, to conduct the training,

(2) contain the particulars of the training, including the names of those participating and the trainer, and
(3) shall note the condition of all equipment used during the training.

3.7.9 The manager shall
(1) appoint a qualified person as a trainer for mine rescue team members,
(2) ensure that all mine rescue team members practice as a team for not less than 8 hours during each 3 month the mine operates, and
(3) ensure that all mine rescue personnel are not underground at any one time except for rescue work or training.

Type of Breathing Apparatus

3.7.10 Where self-contained breathing apparatus is required it shall be of a type approved by a recognized certification agency, and suitable for the intended work.

Mine Plans for Rescue Purposes

3.7.11 The manager shall ensure that the plans required under part 6 of the code are readily available for the use of mine rescue teams.

3.7.12 The manager shall appoint a qualified person
(1) to be responsible for the care and maintenance of all rescue apparatus,
(2) the entries into a logbook to be kept at the mine recording the condition of all equipment used for mine rescue or fire fighting, and
(3) the care of the rescue equipment storage room, and equipment caches.

Rescue Station

3.7.13 The chief inspector may establish mine rescue stations at places the chief inspector considers necessary, all of which shall be equipped and maintained by the government under the direction of the chief inspector.

Emergency Training

Hoistroom Breathing Air and Training

3.8.1 (1) One or more units of self-contained breathing apparatus and a fully charged cylinder of compressed air containing not less than 8.5 cubic meters of free air at normal local atmospheric conditions shall be maintained in every underground hoist room.
(2) Every hoistman and cage tender who may be required to use demand breathing apparatus shall be responsible for ensuring that the apparatus is always readily available to them while they are underground.

Survival Rescue Procedures

3.8.2 (1) The manager of an underground mine shall establish a training program in survival mine rescue, including the use of approved self-rescue apparatus, and the use of fire fighting equipment in place at his mine.
(2) All persons, employed at the mine or not, shall be instructed and trained in these procedures before entering the underground mine.

Instructor Emergency Procedures

3.8.3 The manager of a mine shall appoint a qualified person to instruct and establish a training program for all employees in basic emergency response, and fire fighting.

Fire Fighting

Fire Fighting Equipment

3.9.1 (1) The manager shall ensure that fire fighting equipment is provided and maintained at all locations at the mine where fire may endanger life.
(2) Unless specified otherwise in this code. The British Columbia Fire Code 1998 and subsequent supplements and revisions shall apply in determining the level of fire fighting equipment and maintenance as prescribe in subsection (1).

Underground Fire Fighting

Underground Fire Fighting

3.10.1 (1) The manager shall ensure that fire fighting equipment is provided and maintained at all underground crusher stations, electrical installations, pump stations, shaft stations, tipples, conveyors, service garages, fueling stations, and where a fire hazard may exist.
(2) A suitable number of fire extinguishers of a specified capacity shall be provided and maintained at each stationary diesel motor, transformer substation and any splitter panel.
(3) The location of the fire fighting equipment required by sections 3.10.1(1) and (2) shall be such that, in the event of a fire, the direction of the mine ventilation air flow will not prevent or hamper the effective use of the equipment.

3.10.2 Fire extinguishers which are capable of giving off or generating poisonous gas when operated shall not be allowed below ground and in confined spaces.

3.10.3 The manager shall ensure that inspection and if necessary, testing and maintenance of all fire fighting equipment are carried out by a qualified person at least once a month.

Fire Fighting Plans

3.10.4 The position of all fire fighting pipe lines, hydrant valves, fire stations and fire cabinets shall be shown on a plan drawn to a scale of not less than 1:2500 with a metric scale bar and a marked north point. The plan shall be updated at intervals not exceeding three months.

Underground Coal Fire Fighting

Underground Coal Fire Fighting

3.11.1 For underground coal mines the following sections up to and including section 3.11.6 will apply in addition to all previous sections on fire fighting as may be applicable.

Minimum Requirements

3.11.2 A reservoir containing not less than 100,000 L of water at all times shall be maintained to supply water at adequate volume and pressure to underground coal mine workings.

Provision of Hydrants

3.11.3 Fire hydrants operated by wheel valves shall be located
(1) 20 m on the intake side of conveyor loading and transfer points, main junctions, and electrical substations,
(2) along such roadways as deemed necessary by the mine manager, at intervals not exceeding 100 m., and
(3) at suitable central points in room and pillar workings.

3.11.4 In close proximity to each fire hydrant there shall be a cabinet containing
(1) a branch pipe and nozzle of 40 mm minimum internal diameter, and
(2) sufficient lengths of hose to cover the distance between each cabinet, and the hose shall have a minimum internal diameter of 40 mm and a working pressure of 1000 kPa.

3.11.5 (1) A fire station shall be situated at the bottom level and at every intermediate level of a downcast shaft or slope which provides access to active working areas of the mine.
(2) In the case of a drift mine with a walkable intake airway, the manager may locate a fire station on surface close to that airway.

3.11.6 The minimum equipment housed in or near a fire station shall be
(1) not less than 120 m of fire hose with couplings, branch pipe, a nozzle of 40 mm minimum internal diameter designed to a working pressure of 1,000 kPa,
(2) a back-up supply of fire extinguishers, and
(3) a supply of sand bags or equivalent material.

Gas Detectors

Approved Detector

3.12.1 Every device used for the detection of flammable or noxious gas at a surface or underground mine shall be of a type approved for such use by a recognized testing agency.

Servicing Detectors

3.12.2 The manager shall appoint a qualified person to be responsible for maintaining the appliances used for detection of flammable or noxious gases.

Use of Appliance

3.12.3 The manager shall appoint a qualified person to carry and use an appliance for the detection of flammable or noxious gas. The qualified person shall
(1) check the appliance for damage and to ensure it is in proper working order before use,
(2) not use the appliance if found damaged or dysfunctional, and
(3) take all reasonable precautions to prevent the appliance from being damaged.

Relighting Flame Safety Lamp

3.12.4 In the case of a flame safety lamp with a self-contained relighting device, not attempt to relight the lamp if the presence of flammable gas is suspected.

Evacuation

Procedures and Instructions

3.13.1 The manager of a mine shall
(1) prepare procedures for the safe evacuation of personnel from the mine, or part of the mine, if necessitated by an emergency,
(2) post copies of the procedure in conspicuous places at the surface and underground, and
(3) ensure that each employee receives instruction in the procedures prepared under subsection (1) and that he can recognize the emergency warning system and is familiar with the emergency escape routes from the mine.

Emergency Warning System

3.13.2 The manager shall develop and maintain a system acceptable to an inspector for warning all employees, whether underground or in buildings on surface, of an emergency requiring prompt evacuation of their work places.

Test of System

3.13.3 A test of the warning system required under section 3.13.2 that does not involve evacuation of key process personnel shall be carried out at least once every 12 months on a production shift, and the manager shall ensure that key process personnel unable to evacuate are knowledgeable with the warning system, and the evacuation procedure.

Report of Test

3.13.4 A report of all emergency warning system tests, including their effectiveness, shall be produced in a timely manner by the manager, reviewed by the OHSC and kept on file at the mine.

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Buildings – General

Definitions

"*standard guardrail*" means a guardrail structure comprised of a top rail approximately 1070 mm (42") above floor level, a toe-board, and a midrail approximately midway between the underside of the top rail and the upper edge of the toe-board. They shall be designed to withstand a load of 900 N (200 lbs.) applied in any direction and at any point on the to top rail.

"*toe-board*" means a metal or wood guard strip, approximately 100 mm in height, placed along the bottom of a guardrail structure, and having a clearance of not greater than 13 mm (1/2") between its lower edge and the walkway or platform to prevent tolls or other material from falling off.

"*underground enclosure defined*" in this part means any area in an underground mine that is used to enclose equipment, machinery, or to provide shelter, and is a suitable working environment. It includes service garages, fuelling stations, fuel, and lubrication storage areas.

Design and Construction

4.1.1 (1) All buildings shall be constructed in accordance with the British Columbia Building Code.

(2) Where a building or structure is to be constructed, altered, dismantled, moved, or where major repairs are to be made, the manager shall ensure that

(a) drawings are prepared clearly showing all required field connections and any other information necessary for the safe completion of the work, or

(b) the work is supervised by a professional engineer.

(3) Drawings of the completed building or structure shall be kept at the mine and any revisions to the drawings shall be noted.

Proximity to Underground Workings

4.1.2 (1) Any building, whether or not attached to a headframe or other entrance to an underground mine, shall be of non-combustible construction for any portion that is within 15 m of the headframe or entrance to the mine.

(2) The remainder of the building shall be either of non-combustible construction or separated from the non-combustible section by a firewall, having a 4-hour fire resistance rating, and constructed in accordance with the British Columbia Building Code.

Portable Heaters

4.1.3 Every portable heater shall conform to the relevant sections of the following code, as amended from time to time

(1) CSA Standard B139-00 "Installation Code for Oil Burning Equipment,"

(2) CSA Standard B149.1-00 "Natural Gas and Propane Installation Code,"

(3) Canadian Electrical Code, and

(4) CSA Standard B51-97 "Boiler, Pressure Vessel, and Pressure Piping Code."

Access to Work Areas

4.1.4 (1) The manager shall ensure that all places where work is performed have safe means of access and egress and if necessary an alternate means of escape appropriate to the conditions of the work, and workers shall not use any other means that are, or may be, hazardous.

(2) Where required by an inspector, aisles and passageways in work and in storage areas shall be clearly delineated by floor markings. Such markings shall be maintained in a clearly visible condition

(3)(a) Emergency exits shall be clearly marked and designed to provide quick and unimpeded exit.

(b) doors shall not open directly onto stairways, but shall open onto floors or landings having a width in excess of the swing of the doors,.

(c) double-acting swing doors shall be designed and installed to permit an adequate view through the doors, and

(d) transparent glass doors and glass panels shall be constructed of laminated, tempered, or wired safety glass meeting the current requirements of the British Columbia Building Code.

Equipment Entranceways to Buildings

4.1.5 (1) Any entranceway constructed after this code comes into effect, other than for persons, through which equipment is moved shall

(a) exceed in width by at least 500 mm the width of the equipment where the width of the equipment is less than 3 m,

(b) exceed in width by at least 1 m the width of the equipment where the width of the equipment is 3 m or greater, and

(c) exceed in height by at least 300 mm the height of the equipment.

(2) All power-operated vertical doors installed in equipment entranceways shall have devices along the lower edge which will automatically stop movement of the door upon sensing an intermediate obstruction or when it reaches floor level.

Storage of Materials

4.1.6 (1) No material or equipment shall be so placed, stacked, or stored as to constitute a hazard to persons.

(2) No person shall enter a bin, stockpile area, or any place where there is a danger of becoming trapped in loose material unless safe access has been provided by catwalks, walkways, or other means, or unless he is equipped with a safety belt and a secured lifeline and is attended by another person who is capable of effecting an immediate rescue.

(3) Any area upon which materials may be dropped or dumped shall be barricaded and posted with warning signs to prevent persons from inadvertently entering.

Handrails and Guardrails **4.1.7**

(1) Every flight of stairs having more than 4 risers shall be equipped with handrails on all open sides of the stairways, and on one side of an enclosed stairway 1.12 m or less in width, and on both sides of an enclosed stairway over 1.12 m in width.

(2) The top of a handrail shall be at a height of 810 mm to 910 mm above the stair tread, measured vertically from the nose of the tread, and the height shall not vary on any flight or succession of flights of stairs.

(3) Handrails on open-sided stairways shall be fitted with midrails located approximately equidistant from the top of the handrail and the nose of the stair tread.

(4) When a stairway ends in direct proximity to dangerous traffic or other hazards, detour guardrails shall be installed.

Standard Guardrails **4.1.8**

(1) Standard guardrails shall be installed where any open-sided floor, working platform, runway, walkway, or balcony is more than 1 m above grade or floor level.

(2) When persons are employed around open tanks, containing liquids or harmful substances, the sides of the tanks shall be constructed to extend at least 1 m above any working platform, or standard guardrails shall be provided to prevent persons from falling into the tanks.

Floor Openings **4.1.9**

Openings or pits in floors, roofs, walkways or work areas accessible to persons, shall be securely covered or fitted with fixed, removable or collapsible guardrails.

Toe-boards **4.1.10**

(1) Notwithstanding section 4.1.8, toe-boards are not required to be installed with a standard guardrail

- (a) where persons do not or can not work underneath, or
- (b) where there is no machinery located below.

(2) Where materials are stored nearby, toe-boards shall be increased in height, or solid or mesh panels of appropriate height shall be installed to prevent any material from falling.

Walkways and Vehicle Curbs **4.1.11** (1) Walkways shall not be less than 500 mm in width and shall be provided with safe access by stairways or fixed ladders.

(2) Where necessary, curbs or bullrails not less than 250 mm in height, or similar means, shall be used to prevent vehicles or other equipment from running off the edge of an elevated surface.

Buildings – Surface

Repair Shops **4.2.1** (1) A repair shop shall be located such that site conditions favour adequate drainage away from the shop.

(2) Designated parking areas in the vicinity of the repair shop shall be clearly marked.

Coal Preparation Plant **4.2.2** Where combustible dusts may be continuously, or intermittently, in suspension in the air in coal preparation plants, a dust collecting system shall be provided and shall

(1) if constructed after this code comes into effect, be located away from the working area, outside the building or in a separate room properly ventilated to the outside,

(2) if a dry-type, be of non-combustible construction and equipped with adequate explosion doors or vents, and

(3) if a bag type, only have bags made of anti-static, fire resistant material and be provided with an effective electrical ground.

Dry-type Dust Collectors 4.2.3 A dry-type coal baghouse dust collector shall be provided with a device to
(1) detect the presence of hot or glowing particles upstream from the collector and trigger a quenching action, and
(2) sense a rise in temperature within the collector and sound an alarm and initiate an automatic quenching action at pre-set temperature levels.

Explosion Venting 4.2.4 (1) Provisions shall be made for venting an explosion from any coal preparation and dryer plant building that produces, or may produce, airborne dust in accordance with NFPA 120, Chapter 4 - "Fire and Explosion Prevention of Specific Hazards."
(2) Ventilating hoods and exhaust ducts shall not be used as explosion venting devices unless they are properly designed for a dual purpose.

Monitoring of Explosive Atmospheres 4.2.5 Where explosive atmospheres may occur, such as in, above, or below a coal silo, continuous monitoring of the atmosphere shall be instituted.

Thermal Dryer Discharge 4.2.6 Thermal coal dryers that discharge to enclosed storage shall have equipment to continuously monitor coal discharge for hot or glowing embers of coal and, if detected, an automatic quenching system shall be activated.

Underground Enclosures (Fuel Pipelines and Storage)

Underground Enclosures 4.3.1 All underground enclosures, including service garages, oil and grease storage areas and fuelling stations shall
(1) be designed and protected to prevent the inadvertent entry of an uncontrolled vehicle,
(2) have safe means of entry and exit appropriate for the conditions and purpose of the enclosure,

(3) be equipped with adequate fire protection, and
(4) be adequately ventilated to suit the purpose of the enclosure.

Underground Service Areas

4.3.2 Every underground service garage, fuelling station and oil and grease storage area shall
(1) be located so that a fire or explosion inside the facility would have a minimal effect on other working areas of the mine and on underground installations,
(2) be equipped with an automatically actuated fire suppression system that has been properly designed and installed to provide effective fire protection,
(3) be provided with means for manually actuating the fire suppression system from several locations inside the enclosure and at least one location outside the entrance, and whenever the fire suppression system is actuated, an alarm shall be given automatically at suitable, manned locations on the surface of the mine and underground, or at a central fire control station,
(4) have a concrete floor without service pits,
(5) be equipped with means for containing spills of fuel, oil or grease including the use of fireproof receptacles into which the spilled fuel, oil or grease shall be deposited and removed from the mine without undue delay, and
(6) have adequate clearances for the safe performance of all work.

Underground Fuelling Stations

4.3.3 (1) The manager shall notify the inspector, in writing, of the intention to construct an underground fuelling station.
(2) No smoking shall be allowed in, or near, a fuelling station and signs to this effect shall be posted in conspicuous locations.
(3) A fuelling station shall
  (a) be separate from service garage,
  (b) incorporate a sill or curb to contain spilled fluids, and

(c) be totally enclosed, equipped with a self-closing door of non-flammable construction.

(4) Where a mobile fuelling supply tank is used, the tank shall be clearly labeled with "No Smoking" signs and no person shall smoke within 10 m.

Underground Oil and Grease Storage Areas

4.3.4 (1) The manager shall notify the inspector, in writing, of the intention to construct an underground oil and grease storage enclosure for quantities in excess of those outlined in section 4.8.1(2)(b).

(2) Every underground oil and grease storage enclosure shall be separate from a service garage.

(3) Oil shall not be stored in an underground mine in quantities greater than 500 L unless it is placed in an oil storage enclosure that

- (a) meets the requirements of sections 4.3.1, 4.3.2 and 4.3.4 of the code,
- (b) is provided with a door,
- (c) has a two-hour fire resistance rating, and
- (d) is maintained in proper order and kept free from obstruction so as to be readily usable at all times.

(4) No service garage or fuelling station shall be installed underground unless it meets the appropriate requirements of sections 4.3.1, 4.3.2 and 4.3.4 of the code, and the manager has established a safe operating procedure.

Fuel Pipelines Underground Mines

Fuel Pipelines Underground Construction

4.3.5 Where a fuel pipeline is used in an underground mine it shall

(1) be constructed of minimum or better standard weight wrought iron or steel pipe or the equivalent with respect to strength, durability, corrosion and fire resistance,

(2) have leak proof joints, and if sealants or gaskets are used, they shall be approved by Underwriters Laboratories for fuel oil service,
(3) be designed, installed, and used in accordance with the manufacturer's specifications, and
(4) be drained empty after completion of each fuel transfer.

Installation 4.3.6 A fuel pipeline in an underground mine shall
(1) be installed to minimize the risk of damage and supported so as to avoid dips and sags,
(2) be clearly identified as a fuel pipeline,
(3) be pressure tested before initial use to 345 kPa above atmospheric, or 1.5 times the maximum working pressure, whichever is greater, and the pipeline shall retain the pressure for at least 2 hours after the source of pressure has been removed,
(4) be visually inspected at least once a month, and
(5) not pass through garages, switch rooms, explosive magazines, or refuge stations.

Fuel Storage Tanks Construction 4.3.7 Fuel storage tanks in a fuel transfer pipeline shall
(1) be constructed of steel and designed in accordance with good engineering Practice for their location and use, and NFPA 122 "Storage of Flammable and Combustible Liquids Within Underground Metal and Non-Metal Mines (Other than Coal) 1986" may be used for the design of the tanks except where any requirement conflicts with a requirement of this part of the code,
(2) be supported and anchored to prevent excessive stress concentration on any supporting portion of the shell, and located to minimize the risk of damage, and
(3) have vent pipes of sufficient size, located so that fumes are directed away from any place where they could be a hazard to health or safety.

Fire Protection and Control

4.3.8 Every fuel storage tank shall

(1) have a means of accurately determining the amount of fuel it contains,

(2) be identified as to its contents and that it is a fire hazard area, and

(3) be surrounded by a dike or curb capable of containing 110% of its storage capacity.

Fuel Oil Transfer Systems

4.3.9 (1) A fuel oil transfer system shall have electrical equipment complying with Section 20 of the Canadian Electrical Code, Part 1.

(2) It shall be equipped with a fire suppression system and have adequate fire extinguishers.

(3) It shall be designed and installed so that

- (a) only a pre-set quantity of fuel can be transferred at one time and this quantity shall be less than 90% of the available storage capacity of the receiving tank at the time of the transfer, or
- (b) when the receiving tank is full, a sensing device will stop the flow of fuel at the sending tank, or
- (c) one person at the sending tank and one at the receiving tank shall have suitable communication so that the flow of fuel can be stopped at any time, and the controls and switches at the tanks shall be clearly marked.

(4) Where fuel transfer lines are installed in a shaft, fuel transfer shall not be conducted during hoisting operations.

(5) An authorized person shall be responsible for ensuring that the system is regularly inspected, cleaned and properly maintained, and that all procedures are strictly followed.

Fixed Equipment (Plant and Machinery)

Fall Arresting Devices

4.4.1 (1) Subject to subsection (5), where a person is exposed to the hazard of falling more than 3 m, a fall arresting device shall be used.

(2) The fall arresting device required by subsection (1) shall comply with the relevant design and performance requirements of

(a) CSA Z259.1-95 "Safety Belts and Lanyards", or

(b) CSA Z259.2.1-98 "Fall Arresters, Vertical Lifelines and Rails", or

(c) CSA Z259.2.2-98 "Self-Retracting Devices for Personal Rail-Arrest", or

(d) CSA Z259.2.3-98 "Descent Control Devices."

(3) Safety belts, harnesses, lanyards and lifelines shall not be knotted or allowed to become knotted.

(4) When in use with a fall arresting device, a lifeline shall be anchored so that a person cannot fall, free of arrest, for more than 1220 mm, and it shall be connected to an object that is free from sharp edges and capable of resisting the force of an arrest.

(5) Subsection (1) does not apply to a person employed in shaft sinking where measures are in effect to provide equal or greater protection against falling.

Moving Parts of Machinery

4.4.2 Unless situated so as to prevent a person coming into accidental contact with it, every drive belt, chain, rope or pulley, sprocket, flywheel, geared wheel and every opening through which any belt, pulley or wheel operates, and every bolt, key, set screw and every part of any wheel or other revolving part that projects unevenly from the surface shall be effectively enclosed, covered, or guarded.

Grinders

4.4.3 (1) A grinder shall be assembled, adjusted and operated in accordance with the manufacturer's specifications.

(2) The maximum speed at which a grinding wheel may be operated shall be indicated on the grinding wheel or be easily obtainable.

(3) A grinding wheel shall be

(a) enclosed by a protective hood except for the area at the workrest,

(b) stored where it will not be damaged by impact, extreme heat or cold, and

(c) stopped when the grinder or workrest is being adjusted.

(4) The operator of a grinder shall wear a face shield complying with the relevant requirements of CSA Standard Z94.3.99.

(5) The workrest on a grinder shall be mounted above the centre line of the grinding wheel and not more than 3 mm from the wheel unless otherwise specified by the manufacturer.

(6) An air-operated grinder shall have a governor to prevent it operating in excess of the rated speed of the grinding wheel.

(7) The governor required by subsection (6) shall be inspected regularly and maintained in proper condition.

(8) Powered grinding wheels, other than portable hand held machines, shall be equipped with an exhaust system or other means for removing dust produced during the grinding operation.

Chain Saws

4.4.4 Chain saws shall meet the requirements of CSA Z62.1-95 "Chain Saws".

Pneumatic Tools

4.4.5 (1) Portable pneumatic nailing and stapling tools capable of driving a fastener having a nominal diameter exceeding 1.2 mm (18 gauge ASWG), shall be designed so that the operator is required to make not less than two separate operations to activate the tool. One of these operations shall be to place the tool against the work surface.

(2) Under no circumstance shall the operating trigger be taped or otherwise secured in the "on" position, or held in the "on" position while moving between operations.

(3) The air supply shall be disconnected before the tool is serviced or any adjustments made.

(4) The safe operating air pressure specified by the manufacturer for tools, hoses and fittings shall not be exceeded.

Servicing of Running Machinery

4.4.6 (1) Where machinery requires that it be serviced while in motion

(a) it shall be so constructed that the servicing may be performed without removing any protective fence or guard, and

(b) only that part of the machinery which is vital to the process shall be energized, and

(c) only qualified persons shall be employed in such operations, and

(d) the manager shall establish a safe procedure, which shall be available to employees and posted in suitable locations.

(2) Where it is necessary to remove guards or fences from machinery for servicing purposes, the machinery shall be stopped and locked-out in accordance with sections 4.11.1 to 4.11.7.

Welding and Burning Equipment

4.4.7 (1) Whenever torches or welding equipment are being transported or used, the manager shall require that safe procedures are developed and followed.

(2) Every compressed gas cylinder containing fuel gas or other gas, when not in use, shall

- (a) be stored in an upright position and kept in a well ventilated area free from flammable material and electrical apparatus, and
- (b) have a securely fastened, approved valve protection cap, and be adequately secured by chains or other acceptable means to prevent it from being knocked over.

(3) At any time that compressed gas cylinders are being transported, they shall be secured on a special

carrier or container designed for the purpose, and unless the carrier or container is of a type intended for safely moving gas cylinders, the cylinders shall be fitted with securely fastened, approved valve protection caps.

Powder-actuated Tools **4.4.8** A powder-actuated fastening system, consisting of the tool, power loads and fasteners shall meet the requirements of ANSI Standard A10.3-1995, "American National Standard for Construction and Demolition Operations - Safety Requirements for Powder-Actuated Fastening Systems".

Lifting Devices **4.4.9** (1) A lifting device shall be designed, constructed and installed in accordance with recognized standards and good engineering practice, provided with overwind protection if power operated, and provided with an identification plate.

(2) The maximum load that a lifting device may carry shall be established by its designer.

(3) A notice showing the maximum established load shall be posted in a location visible to the operator and, except during testing, it shall not be exceeded.

(4) Each component that may affect the safe operation of a lifting device shall be examined and tested by a qualified person before initial use and thereafter at intervals not exceeding one year, and a record shall be kept showing the dates, findings and names of the qualified persons performing the examinations and tests and the record shall be kept available for inspection.

(5) Where a combination of lifting devices is used simultaneously, the work shall be supervised by a qualified person.

Install Fire Protection **4.4.10** (1) Fire extinguishing equipment of suitable type and size shall be provided at all fire hazard areas.

(2) A fire suppression system consisting of sprinklers, foam or other suitable means of suppressing fire shall be provided

(a) in an underground mine on fixed equipment containing more than 10 L of flammable fluids actuation of the fire suppression system shall also cause power shut off, and

(b) on the surface, in a building or structure, except a fan house, located above or adjacent to an opening to an underground mine.

Boilers and Engines Near Underground Workings

4.4.11 No part of a steam boiler or stationary internal combustion engine shall be installed within 30 m of any part of the collar of a shaft or openings to underground workings.

Engine Exhausts

4.4.12 (1) The exhaust of an internal combustion engine which is temporarily or permanently installed within a building on the surface shall be conducted to a point outside the building and prevented from re-entering the building, entering the intake of any compressor, contaminating the atmosphere of another building and contaminating mine workings.

(2) No internal combustion engine shall be used in potentially hazardous areas, as defined in the Canadian Electrical Code, Part 1, of surface mine buildings, unless the manager has obtained permission, in writing, from an inspector.

Fans for Supplying Underground Ventilation

4.4.13 All fans supplying ventilating air to underground workings and all structures containing fans shall be of non-combustible construction, installed at the surface except in the case of auxiliary or development fans, and

(1) provided with means for reversing the direction of air flow, and

(2) the flow shall not be reversed without the manager's authorization.

Main Surface Ventilating Fans **4.4.14** (1) Where explosive atmospheres may exist in underground workings, the main surface ventilating fans shall

- (a) be offset not less than 5 m from the nearest side of the mine opening and be equipped with non-combustible air ducts,
- (b) be provided with explosion doors, and
- (c) be operated from a dedicated power circuit.

(2) Notwithstanding subsection (1), a fan may be located directly in front of, or over, a mine opening if

- (a) the opening is not in a direct line with possible air blasts coming out of the mine in the event of an explosion, and
- (b) there is another opening not less than 5 m, or more than 30 m, from the fan opening that is in a direct line with possible air blasts and is equipped with explosion doors.

Elevators **4.4.15** (1) All elevators shall be installed and maintained in accordance with CSA B44-00 "Safety Code for Elevators.

(2) All manlifts shall be installed and maintained in accordance with CSA B311-M1999 "Safety Code for Manlifts."

(3) Prior to initial operation, and thereafter at 12-month intervals, all drive components shall be subjected to non-destructive tests.

(4) A maintenance record shall be kept listing all unsafe conditions reported and the repairs made to each elevator to correct unsafe conditions. This record shall be retained at the mine until abandonment or removal of the elevator.

Conveyor Belts **4.4.16** (1) No person shall ride on a conveyor belt.

(2) No person shall cross a conveyor belt except at an established foot bridge not less than 500 mm in width equipped with guardrails.

(3) Every conveyor way shall be provided with a walkway or other acceptable access for maintenance and inspection purposes.

(4) Every accessible section of a conveyor shall be provided with a pull cord to stop the conveyor in an emergency and the controls shall be arranged so that they have to be reset manually before the conveyor can be restarted after an emergency stop.

(5) On every conveyor which can be started automatically by remote control or where the operator has limited visibility of the whole conveyor, an audible start up warning device shall be installed and there shall be a time delay of at least 10 seconds between the end of a minimum 10 second warning and conveyor start up.

(6) All head, tail, drive, and tension pulleys of a conveyor shall be effectively guarded at their nip points and the guards shall extend for a distance of at least 1 m from the nip point.

(7) A belt conveyor used underground, or a belt conveyor more than 15 m in length installed in a building, or other closed-in structure, shall be provided with a belt slip detection device to stop the drive motor in the event of belt blockage or slippage, and when required by the inspector, with an effective sprinkler system and plugged chute switches which shall stop the conveyor when a plugged chute condition occurs.

Cleaning Up Spillage

(8) Servicing, or cleaning up spillage, on or around a moving conveyor belt shall only be carried out

- (a) where the conveyor system is so constructed that the work can be done safely and without removing any protective fences or guards, and
- (b) by persons who have been fully trained and authorized by the manager to do the work.

(9) When it is necessary to remove protective fences or guards for servicing or cleanup, the conveyor shall be stopped and locked out in accordance with sections 4.11.1 to 4.11.7 of this code.

(10) All guards or fences removed during cleanup or servicing shall be replaced before the locks are removed and the conveyor is started.

(11) The manager shall develop safe work procedures for any work near moving conveyors and submit any major or significant changes to established safe work procedures to the chief inspector for approval and these procedures shall
(a) address specific problems associated with each conveyor at the mine and indicate the speed at which each conveyor travels, and
(b) for cleanup of spillage, include a safe procedure or mechanism for return of material to a moving belt, and a procedure or mechanism to allow the removal of materials lying below the conveyor that protects persons from contact with the moving parts of the conveyor and any material that may fall from the conveyor.
(12) Conveyor belting for use in the transportation of coal or in an explosive atmosphere and in all underground locations shall meet the requirements of CSA Standard CAN/CSA-M422-M87 "Fire Performance and Antistatic Requirements for Conveyor Belting" or an equivalent standard subject to approval by the chief inspector.

Steam and Compressor Plant Operation **4.4.17** (1) The manager shall ensure that procedures for the safe operation of a steam or compressor plant are prepared in writing and made available to persons operating and maintaining the plant.
(2) Steam and compressor plants shall conform to the requirements of the *Power Engineers and Boiler and Pressure Vessel Safety Act.*
(3) A steam boiler or compressor to which the *Boiler and Pressure Vessel Safety Act* does not apply shall be maintained in a proper and safe condition by a qualified person.

Compressors **4.4.18** (1) An air compressor driven by a prime mover exceeding 30 kw, that is lubricated by oil and discharges to a closed system at a pressure greater than 100 kPa, shall have temperature shutdown devices installed at the high-pressure discharge pipe.

Carbon Monoxide Monitor

(2) All compressed air systems that are used to supply underground workings shall incorporate a carbon monoxide monitoring system that continuously monitors the compressed air located between the high-pressure discharge and the receiver.

(3) The carbon monoxide monitoring system shall, when the carbon monoxide sampled reaches 25 ppm, sound an alarm and cause the immediate shutdown of all the compressors connected to the air supply system being sampled.

(4) The manager shall ensure that the carbon monoxide monitoring system is working by testing the system at least monthly and recording the results in the compressor maintenance record.

Underground Mine Heaters

4.4.19 (1) The installation and maintenance of mine air heating equipment authorized by section 6.41.1 of the code, including provisions for mounting, clearances, and air supply, shall conform to the requirements of the following standards as amended from time to time

(a) CSA Standard B139-00, "Installation Code for Oil Burning Equipment,"

(b) CSA Standard B149.1-00 "Natural Gas and Propane Installation Code."

(2) With the exception of embedded pipes or ducts, all parts of the heating system shall be readily accessible for inspection, maintenance, repair, and cleaning.

(3) A carbon monoxide detector, capable of detecting concentrations below 25 ppm, shall be installed to shut down the heater if carbon monoxide in excess of 25 ppm is detected. This detector shall be installed 15 m downstream from where the heated air enters the mine.

(4) Pipelines with gas pressures in excess of 3.45 kPa shall not be located within 15 m of any mine opening.

(5) Pressure regulating stations shall be clearly marked and protected from physical damage.
(6) Propane storage tanks shall be located such that a leak of its contents shall not enter any mine openings.
(7) A vibration switch shall be mounted on the fan cage that will shut down the heater at prescribed vibration limits.

Portable Ladders

4.4.20 Portable ladders shall meet the requirements of CSA Standard CAN3-Z11-M81 "Portable Ladders" or other equivalent standard.

Construction of Portable Ladders

4.4.21 Where portable wooden ladders are constructed and used at a mine
(1) the side rails shall measure not less than 38x89 mm (nominal 2" x 4") for ladders up to 5 m in length and not less than 38x140 mm (nominal 2" x6") for ladders over 5 m in length,
(2) the cleats (rungs) shall be solid lumber not less than 21x89 mm (nominal 1" x4") spaced not more than 300 mm apart, secured in place by nails and with filler blocks of equal thickness to the cleat,
(3) the width between the side rails shall not be less than 380 mm or more than 500 mm, and
(4) a double cleat ladder shall have 3 side rails, evenly spaced, be not less than 1070 mm and not more than 1270 mm in total width, and have cleats that extend the full width of the ladder, and
(5) material used for a ladder shall be of #2 grade or better from the following groups: Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir or Coast-Sitka-Spruce; all lumber shall be graded to the National Lumber Grades Authority Rules or other approved grading rules.

4.4.22 Only transparent, protective coatings shall be applied to wooden ladders.

4.4.23 A portable single or extension ladder shall be held, tied or otherwise secured against slipping. The ladder shall extend at least 1 m above any upper landing to which it provides access.

Fixed Ladders

4.4.24 Fixed ladders shall meet the requirements of the American National Standards Institute (ANSI) Standard A14-3-1992 "Safety Requirements for Fixed Ladders" or other equivalent standards.

Piping Systems
Buried Lines

4.4.25 (1) Piping systems containing substances hazardous to workers because they are corrosive, toxic, flammable or containing an expansible fluid, as defined in the *Power Engineers and Boiler and Pressure Vessel Safety Act*, under pressure shall be identified by a labeling or marking system.
(2) Workers shall be trained to identify the labeling.
(3) The marking or labeling shall be maintained in a legible condition.

4.4.26 Any new installations and where identifiable, any existing buried pipelines, power cables and storage tanks shall be plotted on accurate surface mine plans and where required by the inspector, identified by a system of stakes or signs on the surface.

Elevating Work Platforms and Aerial Devices

Standards

4.5.1 Except as otherwise specified, all elevating work platforms, other than fire-fighting aerial devices, shall be designed, fabricated, operated, inspected, tested and maintained in accordance with the following standards:
(1) CSA Standard CAN/CSA-C225-00 "Vehicle-Mounted Aerial Devices."
(2) CSA Standard CAN3-B354.1-M82 "Elevating Rolling Work Platforms."

(3) CSA Standard CAN3-B354.2-01 "Self-Propelled Elevating Work Platforms,"
(4) CSA Standard CAN3-B354.4 "Boom-Type Elevating Work Platforms,"
(5) CSA Standard B335.1-1994 "Low Lift and High Lift Trucks,"
(6) manufacturer's instructions, and
(7) other standards acceptable to the chief inspector.

Forklift Truck Platforms

4.5.2 Work platforms mounted on forklift trucks and not conforming to section 4.5.1 may be used for emergency or infrequent operations if they are secured to the fork carriage and meet the requirements of section 4.5.3.

Guard Rails

4.5.3 Elevating work platforms and all similar aerial platforms shall have
(1) standard guardrails on all open sides or be enclosed to provide equivalent protection (toe-boards may be omitted at the access openings),
(2) guards to protect the occupants from the elevating machinery, and
(3) signs clearly indicating the safe maximum working load.

Non-destructive Testing

4.5.4 All vehicle mounted aerial devices and self-propelled boom-type elevating work platforms shall have critical components non-destructively tested by a qualified person prior to their introduction to a minesite, and at intervals not to exceed 12 months.

Electrically Insulated Aerial Device

4.5.5 Any aerial device or component thereof that is stated by the manufacturer as being electrically insulated shall be tested annually to ensure that it meets the requirements of CAN/CSA-C225-00 "Vehicle-Mounted Aerial Devices".

4.5.6 Any defects found during the tests required by sections 4.5.4 and 4.5.5, shall be repaired in accordance with instructions issued by a professional engineer before being returned to service.

Logbook

4.5.7 A logbook shall be maintained for each vehicle-mounted aerial device and self-propelled boom-type elevating platform in which any defect, operating difficulty, inspection, test, maintenance, modification and repair work is to be recorded. All entries shall be dated and signed by the person responsible for the work.

Mobile Equipment -- Underground Mines

Diesel Equipment Underground

4.6.1 (1) The manager shall ensure that written procedures for the operation and maintenance of diesel-powered equipment are established.

(2) The fuel for a diesel engine shall conform with CAN/CGSB-3.16-99, "Mining Diesel Fuel," Special-LS.

(3) A minimum of 0.06 cubic metre per second of ventilating air for each kilowatt of power of the diesel-powered equipment operating shall be circulated by mechanical means through every workplace where diesel-powered equipment is operating.

Unattended Vehicles

(4)(a) No piece of mobile diesel equipment shall be left unattended while the engine is running.

(b) On parking a piece of mobile diesel equipment, there shall be a cool down period as established by the OHSC or the manufacturer's specification.

(c) Once the operator leaves the piece of equipment the master switch shall be turned off.

Trackless Diesel Powered Equipment

4.7.1 Trackless diesel-powered equipment for use in
(1) Underground coal mines shall comply with CSA Standard CAN/CSA-M424.1-88, "Flame-Proof Non-Rail Bound Diesel-Powered Machine for Use in Gassy Underground Coal Mines" except where such equipment is not used for cutting, digging and loading of coal the manager shall provide procedures submitted to the chief inspector.
(2) Underground mines, other than coal, shall comply with CAN/CSA-M424.2-90 "Non Rail Bound Diesel-Powered Machines for use in Non Gassy Underground Mines."
(3) Rubber tired, self-propelled underground vehicles shall meet the requirements of CAN/CSA-M-424.3-90 "Braking Performance -- Rubber Tired, Self-Propelled Underground Mining Machines."

Flammable Materials

General Requirements

4.8.1 (1) Oil, grease, liquid fuels, and other flammable materials shall not be kept or stored within 30 m of a shafthouse, mine portal or other mine opening, and the natural drainage from the storage area shall be away from the shaft or mine entrance.
(2) Oil, grease, and flammable liquids used in an underground mine with a flashpoint below 52 degrees Celsius shall
- (a) be transported and stored only in metal containers or receptacles or in portable plastic containers approved for petroleum fuels, and
- (b) when stored underground, unless in an approved enclosure, be restricted to a sufficient quantity for
  - (i) the current day's work in the case of volatile, flammable liquids, and
  - (ii) 7 days in the case of oil and grease.

4.8.2 (1) No device for the generation of acetylene gas and no internal combustion engine that uses gasoline, propane or any other volatile substance as a fuel shall be used in an underground mine.

(2) Except when used for burning or cutting, propane or other similar fuel that is heavier than air when in a gaseous state shall not be allowed underground.

(3) When propane or other similar fuel that is heavier than air is being used underground for burning or cutting, the containers for the fuel shall be of a type certified under the *Energy Act* and shall not have a capacity greater than 10 kg.

4.8.3 Flammable materials shall only be stored in areas approved by the manager and designed for such storage.

Mobile Equipment

Back-up Alarm

4.9.1 (1) The manager shall ensure that every unit of rubber tired mobile equipment in regular use at a mine in excess of 7000 kg gross vehicle weight is equipped with a "back-up" alarm which meets the requirements of SAE J-1446 and SAE J-994. Underground mobile equipment designed for bi-directional use shall be excluded from this requirement.

(2) The alarm shall be clearly audible above the background noise at the workplace and it shall continue as long as the equipment is moving in reverse.

(3) Mobile equipment operating in a mine may use a visual back-up alarm in place of an audible back-up alarm providing that the visual back-up alarm complies with the following criteria:

(a) the light shall be clearly visible above the usual daily light levels,

(b) actuation of the alarm shall be completely independent of the operator, and

(c) the light shall flash as long as the vehicle transmission is in the reverse position.

Transmission Interlock

4.9.2 Every unit of mobile equipment having a fluid drive transmission shall be equipped with an interlocking system to prevent the unit from being started and put into motion unless the transmission selector is returned through the neutral position.

Fire Extinguisher

4.9.3 Every vehicle shall carry at least one fire extinguisher of adequate size and of the proper type.

Vehicle Requirements

4.9.4 (1) All rubber tired mobile equipment over 7000 kg gross vehicle weight shall have a minimum of two wheel chocks which shall be used whenever necessary.

(2) All mobile equipment shall have

(a) a firmly secured seat for the operator and any authorized passenger, well maintained in a comfortable, shock absorbing condition,

(b) approved safety seat belts,

(c) suitable clearance lights and reflectors, and

(d) if an operator cab was provided as part of the original equipment package, or subsequently fitted, windshields, side and rear windows, and rear vision mirrors shall be maintained to provide clear visibility, and the glazing material shall meet the specifications of ANSI Standard Z26.1 - 1990 "Safety Glazing Materials for Glazing Motor Vehicles."

4.9.5 A vehicle, other than a vehicle used directly for production in an operating open pit, shall, additional to that equipment required for highway driving, be equipped with

(1) a whip antenna that is fitted with a flag and lamp high enough to be visible to the drivers of all production vehicles, or

(2) a flashing light mounted above the cab of the vehicle.

Fire Suppression For Underground Mines

4.9.6 (1) All mobile equipment capable of containing more than 25 L of flammable fluids and used in underground mines shall be fitted with a manually activated multi-nozzle fire suppression system. Manual activation of the system shall be possible from each side of the machine and at the operator's station.
(2) Actuation of the fire suppression system shall also cause engine shutdown.
(3) Electric hydraulic diamond drills shall be equipped with

- (a) a deflector shield between the hydraulic pump and the motor, and
- (b) a temperature probe in the hydraulic oil, which will shut down the drill if oil temperature reaches 65 degrees Celsius.

Transportation of Persons

4.9.7 The manager shall ensure that vehicles regularly or primarily used as personnel carriers are suitable for the intended purpose.

Personnel Carriers and Hazardous Materials

4.9.8 (1) Every personnel carrier shall be inspected each day by an authorized person before being used to transport persons, and if any defects are found which could affect the safe operation of the vehicle they shall be corrected before it is used.
(2) Where it is necessary to transport hazardous materials on a personnel carrier at the same time as persons, the materials shall be in an isolated compartment, adequately ventilated and drained, and accessible only from outside of the vehicle. If the compartment is inside the vehicle, it shall be separated from the passenger section by an approved firewall.

Data Plate

4.9.9 (1) No truck or loader shall be operated within a mine unless there is affixed to the inside of the cab, at a place clearly visible to the operator, a nameplate of the vehicle manufacturer showing the serial number and maximum rated load capacity of the vehicle.

(2) Where a truck, scraper or any other rubber tired vehicle, has a gross vehicle weight in excess of 45,000 kg, the name plate referred to in subsection (1) shall also show the maximum allowable speeds at the rated gross vehicle weight that the retarder and/or braking system is designed to accommodate when traveling on

- (a) the maximum downgrade on which the vehicle is designed to operate, and
- (b) not less than 2 other specified slopes between such maximum downgrade slope and level ground.

Braking and Steering Modifications

4.9.10 Every truck, loader or other rubber tired vehicle having a manufacturer's gross vehicle weight in excess of 45,000 kg shall have any modification affecting the braking, steering or resulting in an increase to the gross vehicle weight be approved by the chief inspector.

Rollover Protective Structures

4.9.11 (1) A loader, grader, scraper, tractor, compactor roller, skidder, rough terrain fork lift, bulldozer, and off-highway haul truck introduced into service after July 1, 1991, shall be equipped with a rollover protective structure that conforms with any of the following standards

- (a) Society of Automotive Engineers, Standard SAE-J1040 April 1988 "Performance Criteria for Rollover Protective Structures (ROPS) For Construction, Earthmoving, Forestry and Mining Machines,"
- (b) "Earthmoving Machinery Rollover Protective Structures -- Laboratory Tests and Performance Requirements ISO 3471, or

(c) Canadian Standards Association, Standard B352.095 "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines."

(2) Where the mobile equipment referred to in subsection (1) is designed mainly for underground use,

(a) a ROPS designed by a professional engineer shall conform to Clause 6 of CSA B352-M1980 but does not require physical testing, or

(b) a FOPS (Falling Object Protective Structures) canopy may be substituted for a ROPS canopy provided it is specifically approved by the chief inspector.

Falling Object Protective Structures (FOPS)

4.9.12 (1) The following information shall be permanently marked on rollover protective structures

(a) the name and address of the manufacturer or the registered professional engineer who certified the ROPS,

(b) the model and serial number,

(c) the make, model, and series of the machine for which the rollover protective structure is designed, and

(d) where the ROPS has been designed and constructed in accordance with section 4.9.11 (2), the notation "Underground Use Only" shall be added.

(2) Seat belts of a type conforming with the recommended Practice of the Society of Automotive Engineers SAE-J-386 "Operator Restraint Systems for Off-Road Work Machines" shall be installed in all mobile equipment fitted with a rollover protective structure and the operator of the equipment shall wear the seat belt when operating the equipment.

Rollover Protective Structures ROPS **4.9.13**

(1) No addition, modification, welding or cutting of a ROPS shall be permitted except in accordance with the instructions of a registered professional engineer and all modified ROPS shall be permanently marked to show the modifications made, the date of re-certification and the name and address of the certifying engineer.

(2) A registered professional engineer may re-certify a damaged, deformed or deteriorated ROPS, after repairs have been made, if he is satisfied that the structural integrity has not been impaired.

(3) ROPS shall be designed and fitted so as not to restrict the operator's field of vision.

Tires and Rims **4.9.14**

(1) The manager shall ensure that procedures are in place for the inspection and any work on tires and rims of equipment.

(2) A tire shall not be installed on any damaged, broken, bent or heavily rusted rim assembly and mismatched parts of rims and wheels shall not be used.

(3) No person shall work on tires and rims unless qualified.

Securing of Equipment **4.9.15**

(1) Trucks with dump boxes shall be equipped with a permanently attached device for securing or locking the box in a raised position, or carry suitable equipment on board for this purpose.

(2) No person shall place himself beneath the raised box of a dump truck, bulldozer blade, scraper blade, loader bucket or similar equipment unless it is securely and adequately blocked or otherwise secured independently of the normal operating controls.

Brakes **4.9.16**

(1) Mobile equipment must have braking systems meeting the requirements of the following applicable standard, or other standard acceptable to the chief inspector:

(a) Society of Automotive Engineers (SAE) Standard J/ISO3450 JAN 98, Earthmoving Machinery--Braking Systems of Rubber-Tired Machines--Systems and Performance Requirements and Test Procedures;
(b) Society of Automotive Engineers (SAE) Standard J1026 APR 90, Braking Performance - Crawler Tractors and Crawler Loaders;
(c) Society of Automotive Engineers (SAE) Standard J1472 JUN 87, Braking Performance - Roller Compactors;
(d) ANSI Standard ANSI/ASME B56.6-1992, Safety Standard for Rough Terrain Forklift Trucks;
(e) ANSI Standard ASME B56.1-1993, Safety Standard for Low Lift and High Lift Trucks.

(2) When required by the inspector, an independent means of retardation shall be provided in addition to the requirements of subsection (1).

Parking Brake **4.9.17** Every motor vehicle shall be equipped with an effective, mechanically activated parking brake, the holding power of which is not affected by loss of fluid or air pressure from the braking system.

Common Components **4.9.18** On any vehicle where components that apply the service brakes and the emergency brakes are common, the components shall be arranged so that a failure in a common component does not reduce the capability of one of the systems to stop the vehicle safely.

Brake Testing (Annual) **4.9.19** (1) Trucks having a manufacturer's rated gross vehicle weight in excess of 45,000 kg shall be subjected to downgrade braking tests such that at least once a year 50% of the fleet is tested, and every truck in the fleet is tested at intervals not exceeding 3 years. The tests shall be as follows:

(a) the vehicle shall be loaded to the manufacturer's maximum permissible gross vehicle weight.

(b) the tests shall be conducted on a well-graded hard packed downgrade slope of uniform grade of between 8% and 10% or where there is no downgrade slope satisfying this condition, tests shall be conducted on the maximum downgrade slope over which the trucks are operated,

(c) auxiliary retarding devices shall not be used during the brake tests, and

(d) stopping distances shall be measured from the initial point of application of the service brakes to the final stopping position, from an initial speed of 40 km/h, and the minimum acceptable brake performance shall be as follows:

Initial Speed 40 km/h

Grade	Stopping Distance
10%	84 m
9%	76 m
8%	68 m (2)

Where a vehicle fails to meet the minimum brake performance standards specified under subsection (1) (d), it shall be removed from service until corrective measures have been taken and the vehicle meets the standard.

Auxiliary Steering **4.9.20** (1) If wheeled mobile equipment having rated speed capability exceeding 20 km/h depends on engine power for steering and power failure will prevent the vehicle from being steered manually, a supplementary system shall be provided to enable the operator to steer to a controlled stop.

(2) The supplementary steering system required by subsection (1) shall meet the requirements of Society of Automotive Engineers (SAE) Standard J1511 ISO5010 FEB 94, Steering For Off-Road, Rubber-Tired Machines.

(3) When hydraulic accumulators are used to provide power to supplemental steering systems, they shall depressurize when the engine is deliberately shut down.

Automatic Engine Shutdown

4.9.21 Where automatic engine shutdown devices are employed on vehicles, audible and visual alarms shall be installed in the operator's cab to pre-warn the operator that an automatic engine shutdown is imminent.

Railways

Trains -- Fitments

4.10.1 (1) All trains shall be equipped with suitable tail lights and clearance lights.

(2) If trains are required to reverse, they shall be equipped with a suitable beam or flashing tail light and if they are to be reversed frequently and for lengthy distances, a procedure shall be followed which is acceptable to the inspector.

(3) Every trolley locomotive shall be operated with the trolley pole in the trailing position, unless there is no room to reverse the pole, in which case speed shall not be more than walking speed.

(4) A car shall not be pushed by a locomotive if material extends beyond the length of the car.

(5) Each locomotive shall be equipped with suitable fire extinguishers.

(6) Nothing shall be placed on the top of a locomotive unless it is necessary for its operation and, in that case, it shall be adequately secured, must not extend beyond the ends or sides of the locomotive or into the cab area, and must not obstruct the operator's view.

4.10.2 An engine, locomotive, or trolley car used for hauling material shall be equipped with

(1) properly maintained headlights and clearance lights, and

(2) an audible warning system, which shall be sounded by the operator to warn persons when they may be endangered by movement of the locomotive or train, and whenever the locomotive or train is about to move.

Control Levers

4.10.3 Every storage battery and trolley haulage locomotive shall be equipped with a "deadman" control switch and with a control lever so installed that the lever cannot be removed when the power is on.

Unattended Locomotives

4.10.4 (1) No person shall leave an electric haulage locomotive unattended unless the brakes have been set, the control lever placed in the park position, and the main switch placed in a non-operating position.

(2) Subsection (1) does not apply if the locomotive is on automatic control and approval has been obtained from the chief inspector.

(3) When operated by remote control or by an automated system, it shall be arranged that in the event of any failure of the control or system, the locomotive and cars will be brought to a stop immediately.

Lock-Out Procedures

Lock-Out Procedures

4.11.1 (1) The manager shall develop a lock-out procedure which includes but, is not limited to, the requirements of section 4.11.2 to section 4.11.7 inclusive, and he shall ensure that all persons required to lock-out machinery or equipment are adequately trained in the procedure and that a written copy of it is made available to them.

(2) Notwithstanding subsection (1) where a large number of persons is involved, the manager may develop a lock-out procedure, acceptable to an inspector that modifies the requirements of sections 4.11.4 and 4.11.5.

(3) The lockout procedure developed in section 4.11.1(1) should address the event that a lock has not been removed and the shift has ended.

Power to Be Cut Off

4.11.2 (1) Before any work is performed on electrical equipment, the main power source shall be disconnected, locked-out and tagged.

(2) Where equipment to be worked on is powered by a source other than electricity, the power supply shall be shut off, locked-out and tagged. A means shall be provided to safely release the stored energy from the equipment before any work begins. If a valve in a pipe could leak and allow water, steam, compressed air or other potentially hazardous substance to reach persons working on the equipment, the pipe shall be blanked off, or otherwise isolated, in accordance with the lockout procedure.

Locks and Tags **4.11.3**

(1) Locks and tags shall be issued to each person who works on machinery or equipment that has to be locked out.

(2) A lock issued to any person shall only be capable of being opened by that person's key except that where a number of locks are issued to a person for his sole use, they may be mastered to a single key.

(3) Tags issued to individual persons shall contain space for the recording of the person's name, the type of work being performed, the date and time the work was started and the name of the supervisor in charge.

Affixing and Removal of Locks and Tags **4.11.4**

(1) Each person who works on machinery or equipment requiring to be locked out shall be responsible for affixing his own lock and tag to the lockout device and for removing them on the completion of his work.

(2) The person who affixes the first lock in the lockout procedure shall, before the work begins, attempt to start the equipment or machinery to ensure that it is properly locked out.

(3) A lock shall only be removed by the person who affixed it to the lockout device.

Overlap Between Shifts **4.11.5**

(1) When machinery or equipment is locked out, employees coming on shift shall place their own locks on the lockout device before the employees going off shift remove theirs.

(2) A supervisor may lockout the machinery or equipment during a shift change to allow employees going off shift to remove their locks.

Procedure Before Work Recommences

4.11.6 When work is completed on locked out machinery or equipment, and before any locks or tags are removed, all guards, fences and other safety devices shall be replaced.

Watchman's Responsibilities

4.11.7 In the event that the machinery or equipment cannot be locked out, a tag shall be affixed and a watchman shall be posted at a location where he can prevent anyone from re-energizing the power supply and starting the machinery or equipment. The watchman shall have no other duties at the time and he shall remain at his post until told by the supervisor that he may leave.

Lifting Devices – General

(Bridge and Overhead Traveling Cranes, Monorails and Underhung Cranes)

4.12.1 Electrical bridge and trolley conductors shall be located or guarded to prevent accidental contact by persons.

4.12.2 Each hoist shall have a device to prevent hook travel beyond the safe upper limit at all designed speeds.

4.12.3 Where electrically powered hoisting equipment is operated from cabs, means shall be provided in the cab for the operator to safely disconnect the main power supply under any load condition.

Manually-Operated Hoists and Winches

4.12.4 (1) A hand-operated hoist shall have a ratchet and pawl mechanism, load brake, or other means of safely holding the load at any height.

(2) Crank operated winches, not fitted with automatic load brakes, shall have a means of preventing the crank handle from slipping off the crank shaft while hoisting. On such winches, under free wheel conditions, the crank handle shall be removed before the load is lowered.

Mobile Cranes

4.12.5 Mobile cranes shall be operated with their turntables level, except as permitted by the manufacturer. Level indicating devices shall be provided and used for this purpose.

4.12.6 (1) Outriggers, when deployed to meet load capacity chart requirements, shall be fully extended and secured against retraction. Outrigger beams shall be marked to indicate their fully extended position and jacks shall be extended sufficiently to bear the whole weight of the crane.
(2) Outrigger floats shall be secured to the outrigger jacks when in use.

4.12.7 Mobile cranes shall be securely chocked on firm ground before any hoisting or lowering begins.

4.12.8 Where required by an inspector, any mobile crane that has a lifting capacity exceeding 10 t shall be equipped with a load weight indicator.

Powered Hoists and Winches

4.12.9 Air operated hoists and winches shall be supplied with air at sufficient pressure to ensure safe operation. Inadvertent disconnection of air supply hoses shall be prevented.

Rigging and Slings – General

4.12.10 All rigging and slinging work shall be conducted by, or under the supervision of, qualified persons who are familiar with all aspects of the work and with the proper signals.

Cranes General

4.12.11 A suitable non-destructive test shall be made by a person certified in accordance with the applicable standards of the Canadian General Standards Board 48-GP-4M, 48-GP-7M, 48-GP-8M, and 48-GP-13M on all rigid load carrying components of mobile cranes and bridge cranes greater than 10,000 kg capacity and any other cranes when required by the inspector, before being put in to service and at subsequent intervals not exceeding 12 months.

Automotive Lifts and Other Vehicle Supports

4.12.12 (1) An automotive lift or hoist shall meet the requirements of ANSI Standard ANSI/ALI B153.1-1990, American National Standard for Automotive Lifts - Safety Requirements for the Construction, care, and Use, or other equivalent standard.

(2) A shop crane, jack, axle stand, ramp or other type of vehicle support shall meet the requirements of the applicable section of ANSI Standard ASME PALD-1993, Portable Automotive Lifting Devices, or other equivalent standard.

(3) The rated load capacity shall be marked on each automotive lift, hoist, axle stand, ramp, or other vehicle support and must not be exceeded.

(4) If a device listed in subsection (3) is modified, or if the manufacturer's rated load capacity is not known, the rated load capacity shall be established by a professional engineer.

Raise Climbers

4.13.1 (1) A raise climber shall not be put into service unless all critical, load-bearing components of the complete assembly and accessories have been inspected and tested non-destructively by approved methods.

(2) Subsequent to installation, the tests required by 4.13.1 (1) shall be done at intervals not exceeding 12 months.

(3) A raise climber shall be:
- (a) designed, maintained and operated in accordance with good engineering practice; and
- (b) built and installed according with the design.

Identification Plate

4.13.2 Every raise climber shall have a durable and legible identification plate showing
(1) the name of the manufacturer, the date of manufacture, the model number, and a serial number, and
(2) the maximum allowable speed and the maximum allowable load ratings as certified by the manufacturer or a professional engineer.

Brakes Required

4.13.3 (1) Raise climbers shall be equipped with at least 2 separate and independently operated service brakes, each capable of safely stopping and holding the conveyance under all rated conditions of load and speed.
(2) An automatic overspeed brake shall be installed that is capable of bringing the conveyance to a safe stop under any rated load condition from a predetermined overspeed.
(3) Each brake or braking system shall be capable of being tested independently.
(4) Where electro-mechanical brakes are installed, they shall be actuated immediately if the power supply to the climber is interrupted.

Guards Required

4.13.4 Every raise climber shall have all exposed gearing, chain drives, couplings, or any moving or rotating parts, that could endanger a person who inadvertently comes into contact with them, effectively guarded or otherwise protected.

Controls

4.13.5 An emergency switch shall be provided in the cab of every electrically operated raise climber that will cut off the power supply to the drive motors if the main control contactor fails to open, or in any other emergency situation.

Electric Fittings

4.13.6 (1) All electrical equipment, including switches, connectors, wiring and cables shall be designed, installed and weather-proofed to ensure the safety of the raise climber under any operating conditions.

(2) An electrically powered raise climber shall not be operated in excess of 750 v, and shall be protected by a ground fault system.

Guard Rails and Toe-boards

4.13.7 (1) No one is to ride on the platform of a raise climber while traveling to the face, and where the inclination of a raise is greater than 60 degrees, a substantial cover shall be provided and shall be used when so directed by the supervisor or at the discretion of the worker.

Anchoring of Work Platform

(2) A work platform shall be securely anchored to the raise climber guides or rails while persons are working on the platform.

(3) Unless otherwise approved by the chief inspector, only one raise climber conveyance shall be installed in any raise.

Bolts to Be Torqued

4.13.8 All bolts used in the assembly of a raise climber shall be of the proper grade and size, as specified by the manufacturer. The bolts shall be correctly torqued in accordance with the manufacturer's specifications and no defective or damaged bolts shall be used. All exposed bolts, and other components, shall be adequately protected against falling rock.

4.13.9 Only racks and pinions supplied by the raise climber manufacturer, or certified by a professional engineer, shall be used.

Modifications to Be Approved

4.13.10 Modifications designed to increase the capacity or speed of a raise climber, or modifications that could affect the load carrying capacity of a raise climber or a work platform, shall not be made unless approved by the manufacturer or a professional engineer.

Communication Required

4.13.11 An effective means of communication shall be provided between a raise climber conveyance and the base from which it operates.

Limit of Travel Stops

4.13.12 (1) Whenever a raise climber is operating, the end of the track on which it travels shall be provided with a stop block to prevent the conveyance from being taken beyond the track.

(2) All permanent, electrically driven raise climber installations shall be provided with devices which will automatically stop the conveyance at the upper and lower limits of travel.

Qualified Persons to Maintain Equipment

4.13.13 (1) The manager shall appoint qualified persons to establish mechanical and electrical maintenance schedules for each raise climbing installation, and to ensure that these are carried out in accordance with the manufacturer's recommendations and the provisions of the code.

Records to Be Kept

(2) A record of all prescribed tests, inspections, repairs, and maintenance work carried out, and any defects, damage or problems noted during the inspections or tests, shall be entered in a Raise Climber Logbook which shall be kept at the mine.

Logbook

(3) All entries in the logbook shall be dated and signed by the person who carried out the work, and the supervisor having charge of the installation shall check and countersign the entries at least once each week.

Daily and Weekly Checks

4.13.14 (1) A mechanic shall check an operating raise climber each day to ensure it is operating normally.

(2) The brakes and controls of a raise climber shall be tested prior to first being used during a workshift. The calibration indicator on the overspeed brake shall be checked daily.

(3) Before recommencing operations after a prolonged shutdown, a full inspection of the complete installation shall be carried out by authorized persons.

Fire Extinguisher 4.13.5 Every raise climber shall be provided with a suitable fire extinguisher.

Emergency Procedures 4.13.6 (1) Means shall be readily available to enable persons to descend, if trapped in a raise climber conveyance up a raise, in the event of a power failure or other emergency situation.

(2) The manager shall ensure that operators of raise climbers and, any other persons who would be involved in an emergency descent of trapped persons, are trained in the use of the emergency equipment.

Temporary Work Platforms - General

Scaffold Requirements 4.14.1 Where scaffolding or temporary work platforms are used, they shall be constructed and maintained in accordance with WCB Occupational Health and Safety Regulation 13.

Persons Not Allowed to Ride 4.14.2 No person shall ride on loads, slings, hooks, work platforms, or other similar equipment, unless specifically authorized by the manager, and the authorization shall not be granted for reasons of expediency or personal convenience, but only where it is necessary to the work process, and only when the provision of the normal means of access or conveyance is impracticable.

Requirements 4.14.3 Unless provided elsewhere in the code, work platforms suspended from hoisting equipment shall

(1) be designed by a professional engineer and copies of the design and fabrication drawings shall be kept at the mine,

(2) be equipped with standard guardrails and toe boards on all open sides or be enclosed to give equivalent protection,

(3) be clearly marked with an identification number, the weight of the platform and rigging and the safe working load of the platform,
(4) have supporting hooks and shackles latched or moused to prevent dislodgement, and
(5) not use spreader bars between the load hook and the platform.

Requirements **4.14.4** Work platforms suspended from hoisting equipment shall
(1) be such that the weight of the platform and rigging plus the safe working load of the platform shall not exceed 1/4 of the safe working load of the hoisting equipment,
(2) have all suspension slings and attachments rigged to provide a safety factor of not less than 10. The platform shall be designed with a safety factor of 4,
(3) be suspended from cranes having power booms or fixed booms and from hoisting gear capable of lowering under power, and hoisting and lowering speeds shall be kept as low as practicable and lowering of persons shall only be performed under power,
(4) have power hoists and winches of a type approved for such purpose by the manufacturer,
(5) have dogs in the hoisting equipment drive mechanism secured against inadvertent disengagement,
(6) have a designated person on the platform direct all movement of the platform, and
(7) have persons on the platform wear safety harnesses with lanyards secured to a substantial anchorage on the platform.

Crane or Hoist Operations **4.14.5** A crane or hoist shall be operated by a qualified and authorized person whenever a person is on a suspended platform and the operator shall remain at the controls while the platform is suspended.

Boom Cranes

4.14.6 (1) Telescoping-boom cranes used to suspend a work platform shall incorporate an "Anti-Two Block" device referenced in CSA Standard Z150-1974 "Safety Code for Mobile Cranes."

(2) Non-telescoping boom cranes used with suspended work platforms shall be equipped with an anti-two block warning device which alerts the crane operator before a two block situation occurs. The warning shall be activated when the load hook from which the platform is suspended is within 2 m of the boom sheave.

Inspection

4.14.7 Every suspended work platform shall be regularly inspected by an authorized person, as often as necessary to ensure that it can safely handle its rated load, and if any defect or doubtful condition is noted, the platform shall not be used until
(1) repairs or corrective action has been taken, and
(2) the load carrying components have been non-destructively tested and the platform re-inspected.

Logbooks

4.14.8 A logbook shall be maintained for suspended work platforms in which all tests, inspections, maintenance work and repairs shall be recorded. All entries shall be dated and signed by the person responsible for the work.

Construction – General

4.15 Construction shall be carried out in accordance with instructions of a qualified person and in compliance with WCB Occupational Health and Safety Regulations, Part 20.

Tilt-Up and Pre-Cast Building Construction

4.16 Tilt-Up construction is planned and carried out in accordance with good engineering Practice.

Excavations

Instructions of a Professional Engineer

4.17.1 All excavation work shall be carried out in accordance with the written instructions of a professional engineer where
(1) the excavation is more than 6 m deep,
(2) timber shoring is used in excavations exceeding 3.7 m in width, or
(3) improvements or structures adjacent to the excavation could endanger persons, or
(4) the excavation is subjected to vibration or hydrostatic pressure.

Certification by a Professional Engineer

4.17.2 The written instructions required by section 4.17.1 shall be signed and certified by the professional engineer and be available at the workplace. They shall describe the supporting or sloping requirements and indicate the sub-surface conditions likely to be encountered.

Manager's Requirement

4.17.3 The manager shall ensure that no person enters any excavation over 1.2 m in depth unless
(1) the sides of the excavation are sloped to a safe angle not exceeding 3 horizontal to 4 vertical, or
(2) the sides have been supported in accordance with the minimum requirements specified in Tables 17.1 and 17.2 of this part, or
(3) the sides have been sloped or supported in accordance with the written instructions of a professional engineer.

Combination of Sloping and Shoring

4.17.4 When a combination of sloping and shoring is used, the protection provided to persons shall be equivalent to that meeting the minimum code requirements for the overall depth of the excavation.

Use of Lumber for Shoring and Timbering

4.17.5 Lumber used for shoring and timbering shall be #2 grade and better, and species to be limited to the following groups: Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir or Coast Sitka Spruce. All lumber shall be graded to the National Lumber Grades Authority Rules or other grading rules approved by the chief inspector.

Shoring Contact With Faces of Excavation

4.17.6 Shoring or manufactured or prefabricated support systems shall be installed in firm contact with the faces of the excavation. Any voids shall be backfilled or blocked.

Hydraulic or Pneumatic Jacks

4.17.7 Hydraulic or pneumatic jacks shall have devices which maintain the jacks at their installed length in the event of a loss of internal pressure.

Steel Trench Jacks

4.17.8 Steel trench jacks, with minimum equivalent sizes as shown below, may be substituted for timber struts:

Diameter	Nominal Strut Size Inches (mm)	Nominal Pipe Inches (mm)
(38)	4x4 (89x89)	1.5 Standard
(50)	4x6, 6x6 (89x140, 140x140)	2.0 Standard
(76)	6x8, 8x8 (140x184, 184x184)	3.0 Standard

Use of Plywood

4.17.9 Plywood may be substituted for 50 mm (2") shoring elements provided that
(1) the plywood is not less than 19mm (3/4") in thickness,
(2) the trench is not over 2.7 m in depth,
(3) uprights are installed at no more than 600 mm center to center, and
(4) struts do not bear directly on to plywood

Ladder to Be Kept

4.17.10 A ladder shall be kept in the immediate area of persons working in any excavation over 1.2 m deep.

Requirements Prior to Starting Excavation or Drilling

4.17.11 Prior to starting excavating or drilling, the location of underground utility services in the area shall be accurately determined to ensure persons are not endangered.

Pointed Tools

4.17.12 Pointed tools shall not be used to probe for underground gas and electrical services.

Surrounding Equipment and Objects

4.17.13 Trees, utility poles, rocks and similar objects near an area to be excavated, shall be removed or secured before excavation is commenced.

Excavated Material

4.17.14 Excavated material shall be kept back a minimum distance of 600 mm from the edge of any trench excavation less than 3.6 m wide. In any other excavation, the minimum distance shall be 1.2 m.

Danger of Persons Falling Into Excavation

4.17.15 Where there is a danger of persons falling into an excavation, it shall be covered, or standard guardrails or barriers shall be placed along the exposed sides.

EXCAVATIONS OVER 1.2 M IN DEPTH
TABLE 17.1
SIZE AND SPACING OF MEMBERS (IMPERIAL UNITS)

UPRIGHTS			WALES		STRUTS			
				Maximum	Width of Trench (feet)		Maximum Spacing	
Trench Depth (feet)	Minimum Dimension (inches)	Maximum Spacing (feet)	Minimum Dimension (inches)	Vertical Spacing (feet)	Up to 6 Minimum (inches)	6 to 12 Dimensions (inches)	Vertical (feet)	Horizontal (feet)
Hard and Solid Soils								
4-10	2x10	6	4x6	4	4x4	6x6	4	6
10-15	2x10	3	6x6	4	4x6	6x8	4	6
Soils Likely to Crack or Crumble								
4-10	2x10	3	4x6	4	4x6	6x6	4	6
10-15	2x10	3	6x8	4	6x6	6x8	4	6
Soft, Sandy, Filled or Loose Soils								
4-10	2x10	Close tight	6x8	4	6x6	6x8	4	6
10-15	2x10	Close tight	8x8	4	6x8	6x8	4	6

NOTES:

(1) Wales may be omitted in trenches not exceeding 8 feet (2.44 m) in depth provided the soil is sufficiently hard and solid to safely permit wale deletion and the trench is not in proximity to previously excavated ground.

(1) At least 2 struts shall be installed in each vertical plane where struts are required.

EXCAVATIONS OVER 1.2 M IN DEPTH
TABLE 17.2
SIZE AND SPACING OF MEMBERS (S.I. [METRIC] UNITS)

UPRIGHTS			WALES		STRUTS			
				Maximum	Width of Trench (feet)		Maximum Spacing	
Trench Depth (metres)	Minimum Dimension (mm)	Maximum Spacing (metres)	Minimum Dimension (mm)	Vertical Spacing (metres)	Up to 6 Minimum (mm)	6 to 12 Dimensions (mm)	Vertical (metres)	Horizontal (metres)
Hard and Solid Soils								
1.2-3	38x235	1.8	89x140	1.2	89x89	140x140	1.2	1.8
3-4.6	38x235	0.9	140x140	1.2	89x140	140x191	1.2	1.8
Soils Likely to Crack or Crumble								
1.2-3	38x235	0.9	89x140	1.2	89x140	140x140	1.2	1.8
3-4.6	38x235	0.9	140x191	1.2	140x140	140x140	1.2	1.8
Soft, Sandy, Filled or Loose Soils								
1.2-3	89x235	Close tight	140x191	1.2	140x140	140x191	1.2	1.8
3-4.6	89x235	Close tight	191x191	1.2	140x140	140x191	1.2	1.8

Notes on Table 17.1 apply to Table 17.2

Miscellaneous Hoisting Equipment

Miscellaneous Hoisting Equipment Requirements

4.18.1 Except as otherwise specified in the code, all cranes, derricks and similar hoisting equipment, shall be designed, constructed, erected, disassembled, maintained, and operated in accordance with the requirements of the manufacturer's specifications and instructions, and the following applicable standards, as amended from time to time

(1) Crane Manufacturers' Association of America, Inc. "Specifications for Electric Overhead Traveling Cranes", CMAA Specification #70, 1988,
(2) ANSI B-30.2-1990, "Overhead and Gantry Cranes,"
(3) ANSI B 30.11-1993, "Monorail Systems and Underhung Cranes,"
(4) CSA Standard Z248-1975 "Code for Tower Cranes,"
(5) CSA Standard Z150-1974 "Safety Code for Mobile Cranes,"
(6) ANSI ASME B30.7, 1994, "Base Mounted Drum Hoists,
(7) ANSI B30.16,-1993, "Overhead Hoists,"
(8) ANSI B30.6,-1990, "Derricks,"
(9) CSA Standard CAN/CSA-Z256-M87, "Safety Code for Material Hoists."

Safe Working Load

4.18.2 Where the origin or the safe working load of a crane, derrick, or similar hoisting equipment cannot be ascertained, or its continued safe use cannot be assured, the equipment shall be re-certified by a professional engineer.

Professional Engineer's Certification

4.18.3 Any modification, manufacture, or repair of a structural element or component of a crane, derrick, or hoist shall be approved by the original manufacturer, or carried out under the direction of a professional engineer who shall certify the work performed.

Manufacturer's Manual

4.18.4 The manufacturer's manual for cranes, derricks, and similar hoisting equipment shall be available at the place where the equipment is used. The manual shall show the approved methods of erection, dismantling, operation, adjustment, and maintenance of the component parts and the assembled equipment.

Maintenance History **4.18.5** The manager shall maintain, or obtain a copy of, a file or record of the maintenance history of the following powered hoisting equipment used at the minesite

(1) overhead traveling bridge and gantry cranes,
(2) tower cranes,
(3) stiff leg, guy, A-frame and gin-pole derricks,
(4) material hoists, and
(5) mobile cranes, draglines, and other hoisting equipment of more than 1800 kg (4,000 lbs.) capacity.

Logbook **4.18.6** (1) A logbook shall be provided and maintained for each unit of equipment listed in section 4.18.5. All inspections, modifications, maintenance and repair work shall be recorded in the logbook, and dated and signed by the person who did the work.

(2) Any person involved in the operation of the hoisting equipment shall be responsible for recording in the logbook, any defect or operating difficulty that he notices, and reporting the matter to his supervisor.

(3) The supervisor shall examine, date and sign the logbook, at least weekly, to ensure the required entries have been made.

Name, Model and Serial Number **4.18.7** The name, model, and serial number assigned by the manufacturer shall be clearly visible and legible on every crane, hoist, and derrick.

Permanent Sign **4.18.8** (1) A permanent, clearly visible, and legible sign shall be affixed to each crane, derrick, and hoist showing the safe working load.

(2) The safe working load shall be marked on the load block and superstructure of hoisting equipment and shall be maintained in a legible condition.

(3) The safe working load shall not exceed the safe working capacity of any component in the hoisting system, including the supporting structure.

(4) Subsections (1) and (2) do not apply when the safe working load is affected by
(a) the length of a boom or jib, or its vertical or horizontal angle, or
(b) the position of a load-supporting trolley, or
(c) the use or position of outriggers to increase the stability of the unit.

(5) Where the safe working load is affected by the factors listed in subsection (4), a separate load chart showing the safe working loads in all possible working positions and configurations shall be permanently posted on the equipment or issued to the operator of the equipment. The operator shall keep the load chart in a legible condition and have it available at all times when operating the equipment.

Angle of Boom and Radius Lift **4.18.9** (1) Every crane, derrick, and similar hoisting equipment with a boom that can be moved in a vertical plane shall be provided with a device to indicate the angle of the boom or the radius of the lift.

(2) Telescoping booms shall be suitably marked to indicate the amount of boom extension or be provided with boom extension indicators.

(3) Devices installed in accordance with subsections (1) and (2) shall be clearly visible from the operator's location.

Controls **4.18.10** (1) Each control for a crane, derrick, or hoist shall be clearly marked to show its function.

(2) All bridge, gantry, and overhead traveling cranes operated by pendant or radio controls shall have signs on the crane structure, visible to an operator, clearly indicating the direction of hook, bridge, and trolley motions, compatible with those marked on the controls.

Radio Control Systems **4.18.11** Radio control systems shall meet the following requirements:
(1) they shall be designed to prevent movement of hoisting equipment except in response to actuation of the control devices, and only when all safety circuits are closed,
(2) provisions shall be made to maintain a signal-to-noise ratio of 10 to 1,
(3) multiple signals shall be generated by a minimum of two channels or by a coded single channel,
(4) where a code is used, two parts of the code shall be required for safety, neither of which can be easily generated from ambient signals, and a further information bit shall also be required to distinguish each signal,
(5) where two or more units may be operated in contact with each other, a further code signal shall be required to identify each unit and prevent response by other than the instructed unit, and
(6) the system manufacturer shall certify that the radio controlled system meets the above requirements.

Protection of Hoisting Equipment Operators **4.18.12** (1) Hoisting equipment operators shall be protected against heat, cold, flying, or falling objects or other adverse or dangerous conditions that could endanger them.
(2) Operator cabs shall afford protection from the weather and from overhead hazards. Windows shall be of safety glass or other material providing equivalent protection.
(3) A fire extinguisher, having a ULC rating of at least 5BC shall be immediately available to the operator of each cab-equipped crane.

Miscellaneous Hoisting Equipment – Operation

Operator's Inspection **4.19.1** The operator shall inspect the hoisting equipment at the beginning of his shift and test the limit switches, brakes, circuit breakers, and other control and safety devices. If any defects or problems are noted, the operator shall notify his supervisor and the equipment shall not be operated until the defects or problems have been corrected and authorization received from the supervisor.

Audible Warning Signal **4.19.2** An effective audible warning signal shall be provided on any hoisting equipment and operators shall ensure the signals are used as required.

Boom Stops **4.19.3** Where the design of a crane, derrick, or similar hoisting equipment is such that the boom could fall over backwards, positive boom stops shall be installed. In addition, a device shall be provided to automatically stop the hoisting of a boom when it reaches a predetermined angle.

Operator's Requirements **4.19.4** The operator of hoisting equipment shall
(1) not attempt to hoist any load if he has any doubt that it can be safely handled, but he shall inform his supervisor who will determine what action is required,
(2) ensure a load being handled does not contact the boom and that the boom does not contact any structure or equipment,
(3) ensure the load block is suspended directly over any load being handled,
(4) ensure the loads shall be safely landed, supported, and stabilized before being unhooked, and.
(5) not leave the controls of any hoisting equipment while a load is suspended.

Traveling With a Suspended Load **4.19.5** (1) When a crane is traveling with a suspended load, the operator shall ensure that the load is carried as close to the ground as possible and rigged, as necessary, to control swinging of the load.
(2) When necessary, a person designated as a signaler shall walk ahead of the moving load to warn persons to keep clear.

Authorized Person

4.19.6 (1) All loads shall be slung or hooked by an authorized person.

(2) Whenever the operator does not have an unobstructed view of the load hook and load throughout the whole range of the hoisting operation, he shall act only on the directions of an authorized signaler.

(3) Effective communication systems shall be used when weather conditions or distance render the use of hand signals impracticable or unsafe.

Contact With an Energized Electrical Conductor

4.19.7 Hoisting equipment, which has been in contact with an energized electrical conductor or struck by lightning shall be removed from service and not returned until safe use has been assured by a professional engineer.

Distance From High Voltage Conductors

4.19.8 No work shall be performed nor shall machinery, equipment, tools, or materials be used or stored within the following specified minimum distances from any high voltage electrical conductor or equipment capable of energizing the material or equipment.

Voltage (phase to phase)	Min. Distance
751 v to 75 kv	3 m (10 ft)
Over 75 kv to 250 kv	4.6 m (15 ft)
Over 250 kv to 550 kv	6 m (20 ft)

Two or More Cranes Used on a Lift

4.19.9 Where the use of two or more cranes, derricks and similar hoisting equipment is required in a lifting operation

(1) the operation shall be under the direct supervision of an authorized person, be fully planned in advance and the plans communicated to all persons involved in the operation, and

(2) effective communications shall be established and maintained between all persons involved, during the complete lifting operation.

Loads Not To Be Passed Over Persons

4.19.10 Loads shall not be passed over persons unless there is no practicable alternative, and then only after the persons have been warned of the danger.

Rigging

Use of Riggings and Fittings

4.20.1 Riggings and fittings shall be used only for the purposes for which they were designed and manufactured.

Maximum Rated Loads

4.20.2 Except as otherwise specified by this code
(1) the maximum rated load of any rigging or rigging assembly shall be warranted by the manufacturer of the equipment or by a professional engineer, and
(2) the maximum rated loads shall not exceed
  (a) one-fifth of the ultimate breaking strength of the weakest component of the rigging, or
  (b) one-tenth of the ultimate breaking strength of the weakest component of the rigging, when the rigging is used as a means of supporting workers.

Wedge Socket Connectors

4.20.3 When a wedge socket connector is used as a wire rope terminal, the end of the rope shall be secured to prevent release of the wedge, or rope slippage at the socket.

Open Hooks Not to Be Used

4.20.4 Open hooks shall not be used where dislodgement of the load from the hook would endanger persons.

Securement Against Dislodgement

4.20.5 Shackle pins, heel pins, and similar devices shall be secured against dislodgement.

Sheaves for Running Lines

4.20.6 Sheaves for running lines shall have a means of retaining the rope in the sheave groove.

Protection of Rigging Lines

4.20.7 Rigging lines, slings, and other components shall be protected against cutting, chaffing, and abrasion.

U-bolt Type Cable Clips

4.20.8 When U-bolt type cable clips are used for fastening wire ropes, the U-bolt shall be installed so that it bears on the short or "dead" end of the rope and in accordance with the manufacturers specifications.

Rope to Be Securely Fastened to the Drum

4.20.9 Unless a rope is required to automatically disengage from a winding drum, it shall be securely fastened to the drum and not less than three full turns of rope shall remain on the drum at all times. A rope shall not be secured to the inside of a drum by knotting or by affixing cable clips.

Removal of Hook From Service

4.20.10 A hook shall be removed from service when
(1) the original throat opening has increased by more than 15% as measured at the narrowest point, or
(2) it has twisted more than 10 degrees from its original plane, or
(3) it has cracks or other defects.

Rigging Removal From Service

4.20.11 Rigging shall be removed from service if it has contacted an electric arc, molten metal or other source of excessive temperature.

Safe Working Load

4.20.12 The safe working load of spreader bars and specialized lifting devices shall be certified by a professional engineer and clearly marked on the equipment.

Slings

Requirements

4.21.1 Except for slings which are field assembled in construction operations and which do not have swaged or pressed fittings, all slings made of chain, fiber webbing, wire rope, or which use swaged or pressed fittings, shall at the time of their assembly be permanently and legibly marked with the safe working load and the manufacturer's identification.

Lang's Lay Wire Rope Not to Be Used

4.21.2 Lang's Lay wire ropes shall not be used for slings.

Chain and Chain Slings

4.21.3 Chain and chain slings which have stretched or have links that are deformed, cracked, nicked, gouged, corroded, pitted, or burnt, shall be removed from service.

Fiber Webbing Slings

4.21.4 Fiber webbing slings with nicks, cuts, burns, or other damage or defect shall be removed from service.

Removal of Wire Ropes From Service

4.21.5 Wire ropes shall be removed from service when
(1) in running ropes, 6 randomly distributed wires are broken in 1 rope lay, or 3 wires are broken in 1 strand in any 1 lay, or
(2) in standing ropes and slings, there are more than 2 broken wires in 1 lay in sections between the end fittings.

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Application of Electrical Rules

Codes and Standards

5.1.1 Unless modified by this code, all electrical equipment shall be installed, maintained and operated in accordance with CSA Standard M421-00 Use of Electricity in Mines, in conjunction with the Canadian Electrical Code, as amended from time to time.

Notices and Information

All Mines

5.2.1 (1) The manager shall develop a plan, approved by a registered electrical engineer, for the use of electrical energy at any mine, and the plan shall be forwarded to the chief inspector prior to the introduction of electricity at the mine. A plan shall also be required for any increases in capacity of an existing installation by more than 500 kva.
(2) The plan referred to in subsection (1) shall show the areas at the mine where the electrical energy is to be transmitted and used, including schematic drawings.

Underground Coal Mines and Hazardous Locations

5.2.2 Electrical energy used in an underground coal mine or in a hazardous location shall conform to the requirements of the Canadian Electrical Code.

Certification

5.2.3 The manager of a coal mine, when installing electrical equipment underground, shall
1) if the equipment is new, ensure that is has been certified by the Canadian Explosives Laboratories, NRCAN or MSHA as suitable for use in an underground coal mine, or
2) if the equipment is not new and has been obtained from a source outside of the manager's control, ensure that the equipment has been approved by NRCAN or MSHA in it's current configuration.

Hazardous ations

5.2.4 The manager shall ensure that all electrical equipment used in a hazardous location, as defined in the Canadian Electrical Code, is approved for use in such a location and for the specific gas, vapour, or dust that is or may be present.

Inspection and Maintenance of Power Systems in Underground Coal Mines and Hazardous Locations

Manager's Responsibility

5.3.1 The manager of a coal mine shall

(1) develop an inspection and maintenance schedule for all electrical equipment in use underground or in any hazardous location, as defined by the Canadian Electrical Code, and

(2) designate qualified persons to make the inspections and carry out the maintenance as described in the approved schedule.

Repair of Power System

5.3.2 At any place in an underground coal mine, or in any hazardous location where flammable gas could accumulate, the repair, adjustment, or replacement of electrical equipment shall only be carried out

(1) after the equipment has been disconnected from the power supply and is electrically dead, and

(2) in a location where the electrician doing the work is satisfied that no dangerous concentration of flammable gas is present.

Flammable Gas Warning

5.3.3 In any location where flammable gas could accumulate in dangerous amounts, the manager shall ensure that an approved automatic gas detector is available to continually monitor the air at that location. The monitor shall be of a type that will give an audible or visual warning whenever a predetermined percentage of flammable gas is present.

Isolating Switchgear

Isolating Underground Workings

5.4.1 Switchgear shall be installed at a convenient location on surface to provide the means for isolating all underground circuits. The operation of this switchgear shall be conducted by a qualified person.

(1) Switchgear installed underground shall be built of non-combustible materials and fixed in a vertical position on a metal frame or plate.

(2) Switchboards located underground shall be recessed from haulways and have a floor on which water cannot accumulate.

Trailing Cable Use and Repair

Protective Equipment

5.5.1 Whenever a person is handling an energized trailing cable, he shall use suitable protective equipment.

Defective Cable

5.5.2 Damaged cables shall be inspected by a qualified person before they are returned to service, to ensure that they are in safe operating condition and defective cables shall be removed from service.

Cable Repair

5.5.3 All permanent repairs to damaged trailing cables shall be made by a qualified person who shall examine and test the trailing cables before they are allowed to go back into service.

Submersible Pumps

Ground Fault Protection

5.6.1 A submersible pump that is supplied by a portable trailing cable shall be provided with ground fault protection to limit ground fault current to a maximum of 25 amps and automatically isolate the supply in the event of a ground fault.

Supply Systems for Mobile Electrical Equipment

System Testing **5.7.1** Supply systems for mobile electrical equipment shall be tested before being put into service, and at least once a year thereafter, in order to prove the effectiveness of the ground fault tripping and the ground conductor monitoring circuits.

Record of Testing **5.7.2** A record of the tests required under part 5.7.1 shall be kept at the mine and shall be available for examination.

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General: Design and Operating Procedures

Definitions

"bedrock" means the rock, usually solid, that underlies soil or other unconsolidated material, superficial material.

"bench" means a horizontal step or floor above which material is excavated from a contiguous face and upon which drilling, blasting, and material haulage may be carried on.

"catchment berm" means a bench designed to arrest material which sloughs from a face or wall at elevations above the face being worked.

"clay and silt" means those soils where more than 50% of the particles, by weight, are finer than the No. 200 (0.074 mm) U.S. standard sieve.

"dump berm" means a barrier or ridge of materials other than snow or mud, acting as a guide that will indicate the limit of travel of a vehicle from which material is to be dumped. The heights of the ridge shall not be less than one half the height of the tire of the vehicle from which material is dumped.

"dump block" means a barrier of sufficient size and strength and anchored sufficiently to prevent a vehicle from entering an opening while coasting at a speed of less than 2 km/hr.

"dump material" means waste or any material used in the construction of a dump or stockpile.

"dump person" means a person authorized by the manager and stationed on a dump for the purposes of section 6.10 of the code.

"dumping position" means the position of a haulage vehicle when stopped to dump material and is further defined for section 6.20.4 as the zones of contact between the dump surface and the rear vehicle wheels closest to the dump berm or edge of the bank.

"face" means a surface of rock, ore, coal, or other material exposed by blasting or excavation which extends from a bench or floor to an upper bench or to the natural land surface.

"haulage road" means a part of a mine used for the transport of coal, aggregate, minerals, or waste rock.

"open pit shiftboss" means a supervisor who is responsible for an open pit or part of it and holds an open pit shiftboss certificate granted pursuant to the code.

"ramp" means a sloping roadway and in the case of a surface mine, connects two levels of excavation or benches.

“*sand and gravel*” means those soils where more than 50% of the particles, by weight, are coarser than the No 200 (0.074 mm) U.S. standard sieve.

“*shoulder barrier*” means a barrier or ridge of material, other than snow or mud, placed along the edge or crest of a surface roadway, ramp, dump or stockpile where the vehicles operate and where there is a drop-off of more than 3 m beyond the edge or crest. The height of the barrier shall not be less than ¾ of the height of the largest tire on any vehicle used at that location.

"*soil*" means all unconsolidated materials above bedrock.

“*surface roadway*” means any part of a mine where vehicles carrying persons, materials, or equipment, regularly travel, and includes a haulage road.

“*wall*” means a surface of rock or material exposed by the excavation of one or more faces and benches in successive horizontal layers.

Qualified Persons

6.1.1 (1) The mine manager shall ensure the design of the mine excavations, openings, support systems, fixtures, features, methods of operation and all other works necessary to operate a mine meet acceptable standards of practice and are carried out under the authority of a qualified person or persons.

(2) At every underground mine the manager shall appoint a qualified person to be responsible for all aspects of ventilation in the mine.

(3) The chief inspector may for the purposes of 6.1.1 require the qualified person to be a professional engineer or other licensed professional as may be appropriate.

Notification

Notice To Start Work

6.2.1 The manager shall give 10 days notice to an inspector of intention to start work in, at, or about a mine, including seasonal reactivation.

Notice to Stop Work

6.2.2 The manager shall give notice to an inspector of intention to stop work in, at, or about a mine, permanently, indefinitely, or for a definite period exceeding 30 days, and except in an emergency, the notice shall be not less than seven days.

Manager – Underground

Duty to Post Plans

6.3.1 (1) The manager of every underground mine shall post, or have posted, in a conspicuous place accessible to all persons working underground, a copy of the current emergency and rescue plan required by section 6.3.1(2), and a copy shall be sent to the OHSC.

(2) An emergency and rescue plan of the workings of the mine, satisfactory to the manager and which is in general conformance to accepted standards of practice, on which the main routes of egress from the active workings, sites of all underground refuge stations, and ventilation as required in section 6.3.2(5).

Copy for Inspection

6.3.2 The manager of an operating underground mine shall, upon request,

(1) supply an inspector with an accurate and up-to-date copy of the plan of the underground workings,

(2) a copy of the current emergency and rescue plan required by 6.3.1(2),

(3) a separate underground plan of every level showing all workings, including shafts, tunnels, diamond drill holes, dams, bulkheads, electrical substations, explosives storage, shop areas, permanent seals and stoppings,

(4) vertical mine sections at suitable intervals and azimuths, showing all shafts, tunnels, drifts, sloped roadways, rooms, stopes, diamond drill holes and the location of the top of the bedrock, surface of, and type of, the overburden and the bottom and surface of any known body of water or watercourse or material likely to flow,

(5) a ventilation plan showing the normal direction and volume of the main air currents and the location of permanent fans, ventilation doors, fire doors, stoppings and connections with adjacent mines, and
(6) a plan indicating the position of all fixed electrical apparatus in the mine and the routes of all fixed power feeders and fixed branch feeders, properly rated and referenced, and the rating of all electrical feeder control apparatus and equipment.

Shift Boss Responsibility for Plans

6.3.3 The manager shall ensure each shiftboss is provided with current development plans for the assigned area of responsibility indicating the size, dip and length of all development openings.
The plans shall:
(1) Clearly indicate points where openings, adjacent, old or disused workings are or will be within 30m and 8 m of a breakthrough for the purposes of section 8.10.2.
(2) Clearly indicate points where diamond drill holes may be within 8 meters of a mine opening.
(3) Exploration drill holes that extend into mine travelways and work places from areas where blasting operations may take place shall be marked and effectively blocked.
(4) Exploration drill holes shall have their collars located and the holes shall be plugged as required.

6.3.4 The shiftboss shall ensure the mining crews are informed of those possible breakthrough points in accordance with section 6.3.3.

6.3.5 The manager shall ensure that effective ground support systems are properly installed and maintained, and that a quality control program is in place to ensure that the ground support systems are installed and maintained according to the directions of a qualified person.

Mine Shiftboss - General Rules

Examination of Workings

6.4.1 (1) All active workings shall be examined by the certified shiftboss or supervisor with assigned responsibility to ascertain that they are in a safe working condition, as often as the nature of the work necessitates.
(2) All persons working underground shall have their work areas inspected by a shiftboss or supervisor at least twice per shift.

Daily Examination and Report Book

6.4.2 The person making the examination under section 6.4.1 shall before going off shift record all unusual and hazardous conditions and corrective actions taken or proposed in a daily examination and report book, and sign the report as a record of the conditions found. For underground mines the record shall include a report on each working place examined.

6.4.3 The report made under section 6.4.2 shall be read and countersigned by the corresponding supervisor on the oncoming shift and the unusual and/or hazardous conditions discussed with the workers before they are permitted to resume operations in the areas indicated in the record.

Shiftboss - Surface Mine

Pit Face Area Safety

6.5.1 No work shall be carried on, at, or below a face or wall of a surface mine until that face or wall has been examined and declared safe by the shiftboss.

Dump Block

6.5.2 A dump or stockpile area on the surface of a mine shall be examined by either the open pit shiftboss or a qualified person
(1) before material is permitted to be dumped where dumping has not been carried on for a period of 4 hours or more, and

(2) at least once and at intervals of not more than 4 hours during each shift when material is being dumped, and
(3) the person who conducts the examination shall record the details of the examination and any reports from a dump person in the daily examination and report book referred to in section 6.4.2, and
(4) communicate verbally any abnormal or hazardous conditions to the dump person.

Shiftboss - Underground

Records

6.6.1 Every underground shiftboss shall record daily in his logbook any accumulation of flammable refuse and waste timber in his work area.

Shiftboss - Underground Coal

Shift Inspections

6.7.1 In an underground coal mine a fireboss shall, within three hours before the beginning of each shift, inspect with a locked flame safety lamp or equivalent device approved by a recognized testing agency, and suitable for the work required, that part of the mine and roadways leading to it, in, or through which persons may be present or pass, and shall make a report of the condition of them, and no worker shall enter that part of the mine or roadways until they have been pronounced safe by the fireboss.

Reports

6.7.2 A copy of the report required by 6.7.1 shall be signed by the fireboss, and a copy of it shall be posted at the surface of the mine.

Weekly Inspections

6.7.3 At least once in every week the manager shall cause a fireboss to examine all roadways, air courses, stoppings, sealings, overcasts, and wastes, with a locked flame safety lamp or equivalent device approved by a recognized testing agency, and suitable for the work required, to make a report, and post a copy of it in accordance with section 6.7.2.

Mine Plans

Duty to Keep Plans Surface

6.8.1 The manager shall keep at the mine site accurate plans that are updated in accordance with good engineering practice and are prepared on a scale that accords with good engineering practice, as follows

(1) A surface plan showing the claims, licences or leases on which mining is being carried out, and all lakes, watercourses, naturally unstable ground, such as peat bogs or sloughs, main roads, railways, power transmission lines, buildings, shaft opening, adits, surface workings, diamond drill holes collared on the surface, dumps, dams, tailings ponds and their overflow channels, topographic contours, and any abandoned, adjacent or historical workings.

(2) The manager shall ensure that a thorough search has been completed for the existence of the abandoned, adjacent or historical workings, the results of this search shall be provided to an inspector and a copy maintained at the minesite for inspection.

Failure to Post Plans

6.8.2 If the manager fails to provide the plans required by section 6.8.1, the chief inspector may have the mine surveyed and the plans prepared, and the costs of the survey and the preparation of the plans may be recovered from the owner or agent.

Traffic Control

6.8.3 The manager shall prepare traffic control procedures, showing the maximum allowable speeds for the vehicles in use, rules for passing, "stop" and "yield rules," priority rules for various vehicles, rules for night operation, maximum operating grades, emergency run-off protection, shoulder barriers, and any other information that may be required to ensure the safe operation of all types of vehicles on the mine site.

Mine Haul Road Design

Haulage Road Width

6.9.1 The manager shall prepare a plan pursuant to section 10 (1) of the *Mines Act* which

(1) Shows the type and method of construction for haulage roads that are to be constructed at the mine site.

(2) Except for roads constructed prior to 1990, the manager shall ensure that haulage roads are designed, constructed and maintained to provide

- (a) a travel width where dual lane traffic exists, of not less than 3 times, or where single lane traffic exists, of not less than 2 times the width of the widest haulage vehicle used on the road, and
- (b) a shoulder barrier
  - (i) at least 3/4 of the height of the largest tire on any vehicle hauling on the road,
  - (ii) of a construction or a specification that is in general conformance to accepted engineering practice,
  - (iii) located and maintained along the edge of the haulage road wherever a drop-off greater than 3 m exists, and
  - (iv) incorporating breaks that do not exceed the width of the blade of the equipment constructing and maintaining the breaks to allow for drainage and snow clearance.

(3) For the purpose of subsection (2) (a), the width of the barrier referred to in subsection (2) (b) shall be excluded from the travel width.

Vehicle Runaway Protection

6.9.2 On roadways where the grade exceeds 5% the manager shall have installed and maintained runaway lanes or retardation barriers where conditions/risk warrant.

Dumps

Dumps,

6.10.1 The manager shall require a qualified person to

Roads and Ramps Manager's Responsibility

(1) prepare and maintain a plan pursuant to section 10 (1) of the *Mines Act*, consistent with good engineering practice for dumps, stockpiles, minor impoundments, roads, or ramps that are to be constructed as part of a dumping operation, the plan shall include monitoring for safety,
(2) ensure that the construction is in accordance with the plan and any modification to the plan that has been approved by the manager,
(3) communicate the accepted plan and any modifications to those persons responsible for and employed in the construction,
(4) where material is to be dumped from a vehicle into a bin, raise, or other opening, provide and maintain a barrier of sufficient size and strength and anchored sufficiently to prevent the vehicle from inadvertently entering the bin, raise, or opening,
(5) where dumping is prohibited or hazardous, prevent dumping by placing across the entrance a barrier sufficient to prevent access and a sign that reads "No entry for dumping purposes,"
(6) appoint qualified persons to act as dump persons, and
(7) prepare a procedure for controlling access to areas within the potential run-out zone of all dumps; this procedure will prohibit extended activities below active dumps and provide for a program of monitoring to allow work below inactive and dormant dumps, the procedure will include provisions for signage, work under adverse conditions and shall be reviewed annually.

Underground Mine Design Features

Boundary Pillar

6.11.1 A pillar of not less than 30 m shall be maintained on either side of a party boundary between adjoining underground mining properties.

6.11.2 The owners of adjoining properties may, by written agreement, waive the provisions of section 6.11.1, provided that they inform the chief inspector.

6.11.3 If the owners fail to reach an agreement under section 6.11.1 the chief inspector may, upon application from a manager, authorize the mining of a pillar.

Shaft Pillars 6.11.4 No stoping shall be done within 60 m of a shaft that is used for transporting persons, unless the mining plan has been prepared by a registered professional engineer and the mine manager has so authorized.

Mine Openings

Two Exits 6.12.1 Where an underground mine has been opened by means of an adit, tunnel, or shaft, a second or auxiliary exit shall be provided prior to production.

Distance Between Exits 6.12.2 An auxiliary exit shall not at any point be less than 30 m from the main entrance to underground workings of the mine and shall be separated by solid strata.

Auxiliary Exit 6.12.3 Before stoping is started in any part of a mine, a second or auxiliary exit shall be provided to the working place in that stoping block, or the mine manager shall ensure that a single exit would always be open.

Ease of Travel 6.12.4 An auxiliary exit shall afford easy passage and be provided with good and substantial ladders from the deepest working to the surface, or with hoisting apparatus, which shall constantly be available for use.

New Mine 6.12.5 Where an underground mine is being developed, shafts and raise openings to the surface shall be provided with a substantial collar secured to the bedrock, comprised of concrete, or other material that will perform in the same manner as concrete and is not expected to deteriorate.

Refuge Stations

Location of Refuge Station

6.13.1 Where a workplace in an underground mine is more than 300 m from a mine portal or from a shaft station which is used to access that workplace, the manager shall provide and maintain, in a suitable location for that workplace, a refuge station in accordance with section 6.13.3.

Exemptions

6.13.2 Section 6.13.1 does not apply to a mine under initial adit development or during shaft sinking operations.

Construction and Equipping

6.13.3 Every underground refuge station shall be
(1) clearly identified, constructed of non-combustible material, and of sufficient size to accommodate all persons working in the vicinity,
(2) equipped with a supply of air, a supply of water, a means of communicating with the surface, a means of sealing to prevent entry of gas, and first aid equipment,
(3) equipped with a plan of the mine clearly showing all emergency exits, and
(4) located
(a) 100 metres from explosives magazines,
(b) 100 metres from flammable materials storage, and
(c) constructed or located in such a manner to prevent inadvertent entrance or damage by vehicles, or
(5) In the case of an underground coal mine the manager will establish at appropriate locations storage facilities with suitable equipment to allow for emergency exit from the mine.

Impoundments, Pressure Bulkheads

Plans for Dams and Bulkheads

6.14.1 The manager shall ensure that no structure for impounding water, restraining saturated material or confining air under pressure in any underground roadway or opening is constructed unless the plans and specifications have been prepared by a registered professional engineer.

Exceptions

6.14.2 Section 6.16.1 does not apply in the case of a small structure less than 1 m in height used solely for
(1) diverting the ordinary drainage on a mining level, or
(2) storing water for mining purposes.

Temporary Dams or Bulkheads

6.14.3 Notwithstanding section 6.16.1, a temporary dam or bulkhead may be constructed without prior approval in an emergency, but no person shall be allowed to work in any part of the mine that could be affected by the construction or failure of the dam or bulkhead until a registered professional engineer has examined and accepted it.

Track Haulage Systems

6.15.1 A track haulage system may be designated by the chief inspector as a railway and in that case, it shall be maintained and operated in accordance with the standards established under the *Railway Act*.

Rail Haulage Clearances

6.15.2 Subject to section 6.16.2, where track haulage is used the following continuous minimum clearances between the vehicle and the sides of the roadway shall be maintained
(1) 300 mm on one side and 600 mm on the other, and
(2) a minimum of 300 mm clearance shall be maintained above the head of a person traveling on the haulage vehicle and the roof of the roadway or any obstruction in it.

Underground Mobile Equipment

Mobile Equipment Clearances

6.16.1 Where any mobile equipment is operating, a minimum clearance of 2 m in excess of the maximum width of the vehicle shall be maintained. The vehicle shall be fitted with an approved roll-over-protective structure ROPS or falling object protection structure (FOPS) and there shall be maintained a minimum clearance of 300 mm above ROPS or FOPS.

Reduced Clearances

6.16.2 An inspector may permit reduction of the minimum distances set out in section 6.15.2 and 6.16.1, if safety stations are provided at such distances and under such conditions as he approves.

Safety Stations

6.17.1 The safety stations referred to in section 6.16.2 shall
(1) be plainly marked,
(2) be clean and free of obstructions,
(3) be cut as close to perpendicular as is practical to the haulageway, and
(4) if made after 1990, be at least
(a) 1 m in depth, in addition to the clearance between the vehicle and the wall,
(b) the height of the roadway or 2 m whichever is least, and
(c) 1.5 m in width.

Remote Control Operations

6.18.1 Before any equipment that can be moved by remote control is introduced at a mine, the manager shall
(1) Provide, and have approved by the chief inspector, a plan showing that the system, device or controller is capable of operating only the specific piece of equipment it is designed to operate.
(2) Ensure that other forms of energy are not capable of rendering the equipment inoperative causing uncontrolled activation or operation of the equipment.
(3) The controller be equipped with a lock-out device that renders it inoperative when not in use.
(4) Ensure the transmitter is equipped with an emergency stop mechanism that when activated applies the brakes and shuts down the equipment.

(5) For mobile equipment, if the transmitter is hand held, is equipped with a device that automatically works in the same manner as the emergency stop mechanism if the transmitter is tilted more than 15% from the level position.

(6) For fixed or tracked equipment a device which causes the machine to cease operating if controls are returned to the neutral position.

6.18.2 Where remote controlled equipment is to be used at a mine the manager shall have established operating procedures which shall include

(1) safe location for the operator,

(2) allows for a clear view of the working area,

(3) safe interaction between mechanical and remotely controlled equipment,

(4) a method for recovering equipment which has broken down, and

(5) if applicable, procedures to ensure contiguous operations do not interfere with remote signals.

Equipment Operation - General

Operator's Responsibility

6.19.1 The operator of any unit of mobile equipment shall be directly responsible for its safe operation and for maintaining full control of the unit and complying with all provisions of the *Mines Act*, the regulations, and the code insofar as the operation of the equipment is concerned, and operators shall wear their seatbelts and drive with their headlights on and, where required, a flag equipped whip antenna light or a flashing light on at all times.

Logbook to be Maintained

6.19.2 The manager shall provide and maintain an effective logbook system for each unit of mobile equipment over 7000 kg gross vehicle weight where

(a) the vehicle operator notes the operating condition prior to operating of the vehicle

(b) note any unsafe conditions, and
(c) a qualified person making repairs, notes any repairs made and if the vehicle is safe to operate.

Examination Of Equipment

6.19.3 The operator of any equipment shall examine and check the equipment and read the logbook before putting it into use, and if an unsafe condition is discovered, he shall
(1) not operate the equipment until repairs have been made, or
(2) a qualified person has assured him it is safe to operate the equipment and noted the reason in the logbook

Name of Person

6.19.4 Every notation made in the logbook, maintenance record, and every other record relating to the condition of the equipment shall show the time and date of the entry and the name of the person who made the entry.

Restricted Vision

6.19.5 No person shall operate a unit of mobile equipment where his field of vision is restricted unless he
(1) has inspected the area into which the equipment is to be moved and, without delay, proceeds to operate the equipment, or
(2) is directed by a signal man who is located in a safe position and in continuous contact with the operator of the equipment, or
(3) is directed by a traffic control or warning system.

Disabled Vehicle

6.19.6 When a vehicle or a unit of mobile equipment is disabled or parked in the traveled portion of a roadway
(1) a warning to approaching traffic shall be given by means of flashing lights, flares, lamps, or reflectors, or
(2) a person, equipped to be clearly visible and identifiable, shall direct other vehicles using that section of roadway.

Haulage Vehicle Operations – Surface

Fly Spreading

6.20.1 Where it is proposed to discharge material from the elevated box of a moving haulage truck, the manager shall prepare a safe operating procedure.

Dump Stability

6.20.2 No person shall drive or operate a haulage vehicle in such a manner as to
(1) dump from the vehicle at a location where he has reasonable cause to believe that the ground is not capable of supporting the loaded vehicle, or
(2) remove material from the bottom of a dump or stockpile if he has reasonable cause to believe that a person may be injured as a result of the removal.

Dumping Over Bank

6.20.3 No person shall drive or operate a haulage vehicle, in such a manner as to dump material from the vehicle over a bank that is more than 3 m high, or dump within 3 m of the dump berm crest when the bank is more than 3 m high, except as described in section 6.10.1(4), unless a dump person is directing vehicles to the dumping position and a dump berm is in place.

Reverse When Dumping

6.20.4 The driver of a haulage truck shall not
(1) where the bank is more than 3 m high and the dumping position is within 3 m of the dump berm crest, move the vehicle backward to the dumping position or begin dumping until he has received directions from the dump person,
(2) operate the vehicle in reverse for a distance greater than 4 truck lengths on a dump other than a bin, raise, or other opening referred to in section 6.10.1 (4), or
(3) operate the vehicle in reverse for a distance greater than 4 truck lengths, on a stockpile, ramp, road, or a ramp or road that is under construction, unless the ramp or road has a positive gradient of more than 5% or the procedure is accepted as part of a permit application or work system approval.

Dump Person

6.20.5 A dump person who is responsible for directing vehicles at a dump point shall
(1) continually inspect the condition of the dump site and if abnormal or hazardous conditions are observed take corrective action to alleviate any danger to workers assigned to the dump, and
(2) communicate immediately any abnormal or hazardous conditions found to the open pit shiftboss.

Battery Charging

Battery Charging Stations

6.21.1 A battery charging station in a mine or mine shop shall be located in a well-ventilated location to prevent the accumulation of flammable gases.

Crew Transportation - Rail Track

Riding on Cars

6.22.1 No person, unless authorized by the manager, shall ride on or against a car, locomotive, or train in an underground working.

Passenger Cars

6.22.2 Section 6.22.1 does not apply where persons are being transported on or in passenger cars especially provided for that purpose in compliance with 3.2.4 and hauled by mechanical means provided that
(1) if the car does not have a roof, there shall be a clearance of not less than 1.1 m above each seat,
(2) if the car does have a roof, there shall be a clearance of not less than 150 mm above the roof, and
(3) safety chains shall be used between the cars and between the first car and the locomotive, in addition to the normal couplings except where an insulated draw bar is required.

Surface Mines

Removal of Unconsolidated Material

6.23.1 All trees and other vegetation, clay, earth, sand, gravel, loose rock, or other unconsolidated material lying within 2 m of the rim of a working face or wall in a surface mine shall be removed, and beyond this distance all unconsolidated material shall be sloped to an angle less than the natural angle of repose.

Bench and Berm Widths

6.23.2 Where a surface mine is worked in benches
(1) each catchment berm shall be designed so that its final width will not be less than 8 m,
(2) notwithstanding section 10.5.8, loose rock and soil shall not be allowed to accumulate on a bench or catchment berm in a manner that endangers any person working on a lower bench, and
(3) where loose rock accumulates and where access cannot be gained to clean the catchment berm, and a danger exists to a person working below, a safe working procedure shall be developed.

Surface Mine Faces and Bench Heights

6.23.3 No part of a face or wall of a surface mine shall overhang.

6.23.4 Where material is being worked or removed, the vertical component of the mining face shall not be greater than 2 meters beyond the reach of the loading equipment.

6.23.5 Sections 6.23.3 and 6.23.4 do not apply
(1) where material is removed by backhoe, excavator, dragline or similar equipment operating from above the face that it is excavating, or
(2) where a multiple bench system of mining is being carried on in accordance with conditions authorized by the chief inspector, or
(3) where the material is free running and the slope does not exceed 60 degrees or 30 meters in length.

General Mine Rules

6.24.1 Surface excavations shall be securely fenced against inadvertent access when fencing is considered necessary by an inspector.

6.24.2 Wherever practicable, water sprays or other dust suppression means and devices shall be used at every dusty place where work is carried out and where it is impractical to do so, personal protective equipment shall be supplied and worn by all persons working in that location.

Drilling

6.24.3 A powered rock drill shall not be used in a mine unless it is equipped with a water jet or other device capable of suppressing dust.

General - Underground Rules

Examination

6.25.1 (1) Before any work is begun in an underground mine, a worker shall check his workplace for hazardous or dangerous conditions and he shall not start work until the workplace has been made safe.
(2) Adit entrances and all other openings to underground mines that are no longer in use shall be secured against entry in a manner acceptable to an inspector.

6.25.2 The manager shall ensure that all work places, travel ways and other areas that may be frequented by mine personnel are regularly inspected and maintained by check scaling as conditions warrant and re-supported as may be prudent and that adequate tools and supplies are provided.

Guarding Open Workings **6.25.3** Where persons are working in any location which is below and open to a haulage or travel way on the level above, the workplace shall be securely covered or otherwise closed off from the haulage or travelway.

Guarding Millholes and Manways (1) The top of every millhole, manway, sump, drain hole or other opening shall be covered or otherwise adequately protected to prevent inadvertent access.

(2) Where repair work is being carried out in a manway, or where for any other reason the manway could be dangerous to a person entering it, the manway shall be closed off and warning signs shall be posted at all entrances.

Old Abandoned Workings **6.25.4** No work shall be carried out within 30 m of abandoned or old workings, or any accumulation of water or unconsolidated material, or any other substance that may flow, unless the proposed work procedure has been approved by the manager.

Break-through to Mine Workings **6.25.5** No connection between mine workings shall be made until a thorough examination of the workings toward which the active heading is advancing has been made and has shown that the work can proceed in a safe manner.

Jumbo Drills **6.25.6** No person shall proceed beyond the front of the drill controls of an underground jumbo drill unless the drills have been stopped.

Rock Passes

Water Not To Be Introduced **6.26.1** No person shall introduce water into an ore or waste pass, a loading pocket, coal silo, hopper, storage bin or a completed large diameter borehole for any purpose without following an operating procedure approved by the chief inspector.

Procedure for Removal

6.26.2 If any ore or waste pass is found to contain water, or saturated material which will flow, the manager shall provide a plan for the safe removal of such water or saturated material.

6.26.3 The controls of any ore or waste pass shall be arranged, wherever practicable, to prevent the operator from being hit by a run of material.

Stairways

Requirements

6.27.1 Stairways shall be provided in shafts or manways inclined at 50 degrees from the horizontal or less where necessary to ensure safety.

Handrail

6.27.2 Every stairway greater than 1.5 m in height located in a shaft or manway shall be equipped with a suitably placed handrail.

Tread Size

6.27.3 The rise and tread width of the steps within a stairway shall be uniform and tread widths shall not be less than 250 mm.

Guardrails

6.27.4 When a stairway ends in direct proximity to dangerous traffic or other hazards, detour guardrails shall be installed.

Ladders

General Standards

6.28.1 A ladder used in a mine shall
(1) be of strong construction,
(2) where used underground, be securely fastened to the timbering or wall of the shaft, raise, or stope
(3) be maintained in good repair,
(4) have rungs that are equally spaced,
(5) be installed so that rungs shall be more than 100 mm from the wall or timbering of a shaft, raise or stope, and

(6) be erected at an inclination of not more than 80 degrees from the horizontal unless equipped with safety hoops.

Handrails

6.28.2 Every ladder must project at least 1 m above its landing platform, except where
(1) strong suitable handrails are provided on the platform, and
(2) the ladder is securely fastened to its platform.

Platforms

6.28.3 Where a shaft or manway, driven after the proclamation of this code, is inclined at over 50 degrees from the horizontal, it shall be provided with a ladderway containing platforms erected at vertical intervals not exceeding 7.5 m in the ladderway. Each platform shall have an opening which permits a person wearing a self-contained breathing apparatus to pass through.

6.28.4 Where a shaft or manway is inclined at over 70 degrees from the horizontal, the ladderway, in addition to the requirements of section 6.28.3, shall have the individual ladders between each platform so located that they act as shields or protections to cover the holes in the platforms.

Doors in Platforms

6.28.5 Where it is possible for a person to fall from one platform to a lower platform in a ladderway, the platform openings shall be covered by suitable doors which can be easily opened from above or below.

Ladderways in Other Mine Workings

6.28.6 A landing platform shall be installed at all points where ladders are offset.

6.28.7 All ladderways in raises, stopes and manways shall be installed and maintained to reduce the hazard of a person falling.

Travel in Manways with Skips

6.28.8 When a ladderway and a skipway occupy the same compartment in a manway
(1) the ladders shall be adequately protected from material being hoisted,
(2) no person shall travel or be allowed in the ladderway while the skip is in motion except to handle material in the skip, and
(3) sufficient guardrails shall be installed to prevent a person using the ladderway from falling into the skipway.

Flexible Ladders

6.28.9 No person shall use, or allow to be used, a flexible ladder except
(1) in a shaft sinking operation,
(2) in an emergency rescue operation, and
(3) provided that the ladder is safe and secure.

Raise – Underground

Two-Compartment Raises

6.29.1 Except where approved raise driving equipment is used, every raise inclined at more than 50 degrees from the horizontal and being driven more than 16 m slope distance, shall:
(1) be divided into at least two compartments, one of which shall be maintained as a ladderway and equipped with suitable ladders maintained to within 12 m of the face as it is being driven, and
(2) if the second compartment is used to hold rock excavated from the face, it shall either be kept full, or suitable protection shall be provided to prevent a person from falling into this compartment.

Flammable Waste & Scrap – Underground

Removal

6.30.1 All waste, including waste timber, shall be removed from an underground mine on a regular basis and shall not be piled up nor permitted to decay in the mine.

Storage and Removal

6.30.2 In an underground mine, or in or about a headframe or shaft-house, flammable refuse shall be
(1) deposited in covered, fire-resistant containers, and
(2) removed at least weekly from the mine, headframe, or shaft-house.

Sulphide Dust

6.31.1 In any underground mine where the sulphur content of the ore is high and a sulphide dust explosion has occurred, the manager shall approve and implement a scheme for minimizing the danger from a sulphide dust explosion including
(1) provision for ensuring that all persons are removed to a place of safety prior to blasting, taking into consideration the mine layout and the ventilation circuits, and if necessary, removed to the surface of the mine,
(2) provision for ensuring that all accessible headings, raises, and other workplaces within 30 m of a blasting site are washed down to remove dust prior to blasting, and
(3) any other measures that could reduce the risk of a dust explosion or lessen the consequences if one should occur.

Fire Doors – Underground

Fire Doors

6.32.1 In any mine, there shall be a sufficient number of fire doors installed underground to isolate the shaft or other entrance to the mine from the mine workings.

6.32.2 Fire doors shall be
(1) of fire resistant construction and of at least one-hour fire resistance rating,
(2) maintained in proper order,
(3) kept clear of all obstructions so as to be readily usable at all times, and
(4) equipped with a self-closing mandoor to allow the escape of a person trapped behind it.

Ventilation Standard

6.33.1 The return air from all working places shall, whenever practicable, be routed directly to the return airway.

Barometer

6.33.2 A barometer and a thermometer shall be placed in a conspicuous position at the entrance of an underground coal mine, and both shall be read as part of the duties of the persons appointed to examine the mine workings under Sections 6.7.1 and 6.7.3.

Main Ventilation – Interruptions

Interruption to Main Fan

6.34.1 If the main system of ventilation for an underground mine is stopped, other than through a brief interruption of the power supply, all persons shall be withdrawn to the surface of the mine or to an approved refuge station in accordance with the manager's emergency procedures, and there shall be no entry of persons until the ventilation has been restored and the workings inspected and declared safe by an authorized person.

Underground Mine Heating

Mine Air Heaters

6.35.1 No furnace or device for heating mine air shall be installed without the written permission of an inspector.

Auxiliary Ventilation

Provisions of Ventilation

6.36.1 The manager shall ensure that all workings that are removed from the main ventilation circuit have an adequate supply of ventilating air.

Manager's Rules

6.36.2 Where auxiliary ventilation systems are necessary, the manager of an underground mine shall prepare rules and procedures for the installation and use of auxiliary ventilation systems and, in the case of a coal mine, for the degassing of headings. A copy of the procedures shall be posted at a conspicuous location at the mine.

No Re-circulation of Air

6.36.3 An auxiliary fan shall not be installed or operated in an underground mine other than in accordance with the rules and procedures prepared under section 6.36.2, and the manager shall ensure that

(1) sufficient fresh air reaches the fan at all times to prevent re-circulation,

(2) air circulated by the fan is not contaminated with dust or flammable gas in excess of the limits specified in the rules and procedures prepared under section 6.36.2, and that no air containing more than 1.25% by volume of flammable gas passes through or over the fan,

(3) every auxiliary fan shall be electrically connected to ground to prevent the accumulation of an electrostatic charge,

Aluminum Parts Prohibited

(4) no auxiliary or booster fan shall be installed or operated in an underground coal mine if any of its component parts is made of aluminum, magnesium, titanium or a light metal alloy unless adequately coated with a non-sparking material, and

(5) the manager shall establish an inspection program to regularly inspect coated fans and shall have them immediately removed from service if the coating is damaged.

Compressed Air Machine Exhaust

6.36.4 The exhaust from any compressed air machine shall not be considered as ventilation.

Ventilation Monitoring

Air Measurements

6.37.1 The manager of an underground mine shall ensure that measurements of the quantity of air flowing are taken at the main fan, in all main airways, and at all major ventilation splits at intervals not exceeding 3 months.

Diesel Equipment Ventilation

6.37.2 In a mine or part of a mine in which diesel equipment is operating underground

(1) measurements of the quantity of air flowing shall be taken at intervals not exceeding once a week,

(2) tests shall be made at least once a shift, in the general body of the air, on the exhaust side of the operating diesel equipment, for nitrogen dioxide or oxides of nitrogen and other gases specified by an inspector,
(3) the time-weighted average exposure of a worker to airborne respirable combustible dust shall be no more than 1.5 milligrams per cubic metre of air, and
(4) the worker may request that tests be conducted to determine the volume of air flow, carbon monoxide, nitrogen dioxide, formaldehyde, or respirable combustible dust contents of the atmosphere.

Recording **6.37.3** The measurements required to be taken under sections 6.37.2(1) and 6.37.2(2) shall be recorded in a book kept for that purpose.

Doors and Regulators

Door Closing **6.38.1** All doors used for regulating or controlling ventilation shall close automatically and be provided with a suitable device for opening or closing them.

Quantities - Splits - Measurement for Coal Mines

Ventilation Splits **6.39.1** Where necessary for efficient and effective ventilation, every mine shall be divided into separate ventilating splits and no working place shall be ventilated by series ventilation.

Measurements **6.39.2** Air measurements shall be taken to determine the quantity of air circulating
(1) within 90 m from the first normal working place in each split intake,
(2) in the intake and return airways of each ventilating split, and
(3) in the main intake and return airways of the mine.

Recording **6.39.3** The measurements referred to in section 6.39.2 shall be taken once per month and the results shall be entered in a book to be kept at the mine.

Unventilated Workings

Prevention Of Access

6.40.1 The manager shall ensure that any part of an underground mine that is not being ventilated shall
(1) be effectively barricaded to prevent inadvertent entry,
(2) be posted with signs warning that entry is prohibited, and
(3) before anyone enters or is permitted to enter that part of the mine, be examined by a qualified person for
  (a) oxygen deficiency,
  (b) the presence of toxic or noxious gases, fumes, mists, vapours, or dust, and
  (c) any other dangerous condition.

6.40.2 All worked out or closed parts of an underground coal mine and those not part of the mine ventilation system shall be sealed with substantial stoppings.

Stoppings - Coal Mines

Stopping Construction

6.41.1 All stoppings between intake and return airways shall be of substantial construction and built in a manner to prevent any undue leakage of air.

6.41.2 The space between the faces of all stoppings and the airways shall be kept free of obstructions.

Monitoring

6.41.3 Provisions shall be made for monitoring the conditions beh stoppings.

Flammable Gas

Gas Detection

6.42.1 Where it may be reasonable to expect that there is a hazard due to the presence of flammable gas, an inspector may require that a sufficient number of appliances of an approved type be provided for the determination of the percentages of flammable gas.

Qualifications

6.42.2 The manager of an underground mine shall appoint a qualified person to make regular determinations of the content of flammable gas in the mine air at such locations and at such time intervals as established by the manager. The results of the determinations shall be entered in a book kept for this purpose at the mine.

Reporting

6.42.3 If air immediately returning from a split that ventilates a group of active workings, or if air in the main return airway, is found to contain more than 1% of flammable gas as determined with an approved means of detection, the person who detects it shall immediately report his findings to the manager and the manager shall
(1) take immediate steps to improve the ventilation, and
(2) mail a notice of the condition to an inspector within 24 hours.

Electrical Equipment

6.42.4 If any person finds more than 1.25% of flammable gas in the air in the general vicinity of electrical machinery or equipment he shall cut off the electrical power supply from the machinery or equipment and report the circumstances to the supervisor in charge of that part of the mine.

Coal Mines - Withdrawal Of Persons

6.42.5 (1) Whenever the general body of the air in any workplace or travelway in a mine is found to contain 2.5% or more of flammable gas, the person in charge of that part of the mine shall
(a) immediately cause all persons in that area and the return airway to be withdrawn to a place of safety,
(b) inform without delay his immediate supervisor, and
(c) insofar as it is possible to do so without undue risk, ascertain or have a qualified person ascertain, the condition of the affected area and the return airway and carry out the measures necessary to render it safe.

Examination

(2) Except for the purpose of saving life or rendering the area safe, no person shall be readmitted to the affected area until the person in charge of that part of the mine, or a qualified person appointed by the manager, has examined the area and reported it to be safe.

Recording

(3) Where persons have been ordered to leave an affected area under this section, the person who caused them to leave shall record in a book kept for that purpose at the mine, particulars of the reason for the order, and the person who carried out the examination required in subsection 6.42.5(2) shall report the result of it in that book.

Prevention of Ignition

Manager's Responsibility

6.43.1 Where a machine is in use at a working face at which gas is liable to be ignited by such use, the manager shall ensure that
(1) the machine is provided with effective means to prevent the ignition, or
(2) an adequate portable fire extinguisher is available at or near the machine.

6.43.2 The manager shall provide a detector that gives an audible and/or visible warning of a hazardous accumulation of flammable gas where electrically powered machinery is used at the coal face or at any other place specified by an inspector.

Prohibited Metals

6.43.3 Nothing made of, or containing, aluminum, magnesium, titanium, or light metal alloy shall be used in an underground coal mine, except
(1) electrical equipment within a flameproof enclosure, or
(2) in circumstances when there is no possibility of friction or impact, or
(3) unless adequately coated with non-sparking material and immediately removed from service if the coating is damaged, or
(4) hand held tools which are placed in a non-sparking storage container following use.

Automatic Gas Detector

6.43.4 Where electrically powered equipment is being operated at a coal face in an underground mine, the manager shall ensure that an automatic gas detector of a type that is approved by a recognized body is installed. The detector shall be installed in such a manner that if a predetermined level of flammable gas is detected, all electrically powered machinery is shut down and is not restarted until gas levels have fallen below the prescribed level.

Gas Detectors

6.43.5 (1) The supervisors shall check all gas detectors in underground coal mines daily, by comparing the reading obtained from the fixed detector with the reading obtained from a supervisor's detector.
(2) If a variance of 10% or more occurs in daily readings, both detectors are to be immediately removed from service, replaced before operations restart, and calibrated against a known concentration of gas.
(3) All gas detectors in underground coal mines shall be removed once per month, serviced and tested against a known concentration of flammable gas.
(4) The manager shall ensure that records are kept of all calibration tests and maintenance carried out on gas detection devices and that those records are available to an inspector on request.

Combustible Dust - Coal Mines

Treatment

6.44.1 The floor, roof and sides of every road or part of a road that is accessible shall be treated
(1) with water in the manner and at the intervals that will ensure that the dust on the floor, roof, and sides, respectively, is always combined throughout with 30% by weight of water in the intimate mixture, or
(2) with incombustible dust in a manner and at intervals that will ensure the dust on the floor, roof, and sides,

respectively, shall always consist throughout of a mixture containing not more than 50% of combustible matter if the volatile matter content of the coal does not exceed 22% as determined by one of the standard methods of analysis and computed on a dry, ash free basis.

Method (3) Before the first application of incombustible dust as required by this part of the code, accumulated coal dust shall be removed from the roof, floor and sides of the roadway, so far as practicable.

Permissible Levels **6.44.2** The maximum permissible percentage of combustible matter under section 6.44.1 shall diminish by 1.5% for each 1% increase of volatile matter of the coal until it has been reduced to 35 in the case of coal having a volatile matter content of 32% or more.

Samples **6.44.3** For the purpose of determining the volatile matter content of the coal under section 6.44.2, samples shall be taken either from representative sections of the seam or from a representative quantity of the run of mine coal from the seam.

Methane **6.44.4** The permissible percentage of combustible matter in the dust found in an underground roadway shall be further decreased by one for each increment of 1/10 part of 1% in the methane content of the mine air beyond 1/4 of 1%.

Moisture **6.44.5** The percentage of incombustible dust required under this section may be reduced by an amount equivalent to the percentage of water present in the mixture.

Exception **6.44.6** The obligations imposed by this section do not apply to a roadway, if the natural conditions of it as regards the presence of incombustible dust and moisture are found by tests made in accordance with this section to be such as to comply with the foregoing requirements.

Fineness of Dust **6.44.7** The incombustible dust used for the purpose of this part of the code shall, whenever possible, contain not less than 50% by weight of fine material capable, when dry, of passing through a No. 80 sieve of the Canadian Metric Sieve Series.

Sampling **6.44.8** If the amount of incombustible dust passing through the No. 80 sieve is less than 50%, the percentage of combustible matter specified as being the maximum permissible by sections 6.44.1(2), 6.44.2, 6.44.4 and 6.44.5 shall be decreased proportionately, but the percentage of the fine material shall never fall below 25%.

6.44.9 To obtain the composition of the dust mixture in a road or part of a road, the following procedure shall be adopted
(1) representative samples of the dust shall be collected from the floor, roof, and sides over a section of the road not less than 30 m in length, the sections being not more than 135 m apart in the same roadway, and
(2) each sample collected shall be thoroughly mixed and quartered, and a portion of the mixture shall then be sifted through a No. 315 sieve of the Canadian Metric Sieve Series

Analysis of Roadway Dust **6.44.10** If the roadway dust is known to contain only negligible percentages of either gypsum or carbonates
(1) a weighed quantity of the dust that has passed through the sieve shall be dried at a temperature of 105 degrees Celsius and the weight lost shall be reckoned as moisture, and
(2) the sample shall then be brought to a red heat in an open vessel until it no longer loses weight, and the weight lost by incineration shall be reckoned as combustible matter for the purpose of the test.

Gypsum **6.44.11** If the incombustible dust applied to a roadway consists of gypsum wholly or in part

(1) a weighed quantity of the sieved dust shall be dried at a temperature between 135 degrees Celsius and 140 degrees Celsius and the weight lost shall be reckoned as moisture, and
(2) the sample shall then be kept at a red heat in an open vessel until complete incineration, and the weight of the residue added to that of the moisture shall be reckoned as incombustible matter and expressed as a percentage of the total weight of sieved dust treated.

Carbonate **6.44.12** If the roadway dust contains an appreciable proportion of carbonates, the following method shall be followed
(1) a weighed quantity of the dust that has passed through the sieve shall be dried at a temperature of 105 degrees Celsius, and one hundred times the weight lost divided by the number of grams of dust submitted to the test shall be reckoned as the percentage of moisture, and
(2) one gram of the sample so dried shall then be treated with dilute hydrochloric acid in a suitable apparatus; the weight lost through the decomposition of the carbonates shall be ascertained and subsequently added to that of the incombustible solid residue of another gram of the same sample having been subjected in an open crucible and for not less than one hour to a temperature exceeding 925 degrees Celsius, and this total, plus the moisture previously determined, shall be recorded as incombustible matter.

Tests to be Recorded **6.44.13** The results of the tests of the roadway dust shall be recorded in a book kept at the mine for the purpose, and a copy posted at the mine entrance, and available on request.

Frequency of Tests **6.44.14** Tests of samples of roadway dust, so taken as to be representative of the normal composition of the roadway dust throughout the mine and on the floor, roof, and sides, respectively, shall be made as often as may be necessary, but not less frequently than once in each month.

Injurious Dust 6.44.16 Incombustible dust that is ineffective or injurious to health shall not be used in a mine.

Explosion Barriers - Coal Mines

Type 6.45.1 (1) In any underground coal mine which is dry and dusty, rock dust or water barriers of a type authorized by an inspector shall be installed at places designated in a scheme prepared by the manager and authorized by an inspector.

Inspection (2) Where explosion barriers are required in an underground coal mine, the manager shall appoint a person who holds an underground coal mine shiftboss certificate to examine the condition and position of the barriers.

Frequency (3) The person appointed under subsection (2) shall examine the barriers at intervals of not more than 4 weeks and shall report the results of the examination in writing in a book to be kept at the mine.

Explosion Barriers – Other Mines

Other Mines 6.46.1 The chief inspector may order the manager to prepare a similar, authorized scheme at any mine where the chief inspector believes that a hazard may exist from the ignition of flammable gas or dust.

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Definitions

"bail" means the supporting structure for a shaft conveyance whereby the conveyance is connected, through suspension gear, to the hoisting rope

"cage call system" means an independent, electrically operated signaling system which may be activated at any shaft station and results in audible signals at all shaft stations

"chair" means a moveable support arranged to hold a shaft conveyance as required.

"destructive testing" means a test on a sample of a shaft rope where the rope or individual wires from the rope are broken by a testing machine

"electromagnetic device" means a device using an electromagnetic system for examining shaft ropes

"factor of safety (ropes)" means the number of times the breaking strength of a shaft rope exceeds the weight it supports at a specified location of the rope.

"headframe" means a structure at the top of a mine shaft which carries the sheaves for the hoisting ropes

"hoist " in this part of the code, "hoist" means a hoisting engine used to raise or lower persons, rock or any other material, in a shaft conveyance, through a vertical or inclined shaft

"hoist signaling system" means an independent, electrically operated signaling system which may be activated at any place within the shaft and results in audible signals at the hoist operator's place of work and at all shaft stations.

"mine hoisting plant" means a mine hoist for an underground mine and includes the prime mover, transmission equipment, head frame, sheaves, ropes, shaft, shaft conveyances, shaft sinking equipment, shaft furnishings, hoist controls, counterweight, signaling and communications equipment and any other equipment used in connection with a hoist.

"non-destructive test" means the examination of a part without subjecting it to physical distortion, damage, or destruction.

"prime mover" means a machine or other device that provides an initial source of motive power.

"reactivated mine hoisting plant" means a mine hoisting plant that is placed into service after being out of use for a period in excess of one year.

"safety catch" means a safety appliance or fitting which transfers the weight of the cage onto the shaft guides if the hoisting rope breaks.

"safety dogs" means those portions of the safety catches which penetrate the shaft guides if the hoisting rope breaks.

"shaft or winze" means an excavation of limited perimeter compared with its depth in which persons and material, or both, are transported by means of a mine hoisting plant.

"shaft casing" means the continuous steel lining of a shaft.

"shaft conveyance" means a conveyance raised or lowered by a mine hoist in a shaft and includes a bucket, a single or multi-deck cage, a skip or combination of skip and cage used to transport workers and material or both.

"shaft furnishing" means any installation within the shaft, other than casing and lining, which is required to support the shaft or services therein.

"shaft lining" means the timber, concrete, brick or steel structure, or weld mesh, fixed around the shaft to support the walls. This does not imply continuous lining.

"shaft obstruction" means any protrusion into a shaft compartment in which hoisting may be carried out.

"shaft rope" means any rope used with a shaft hoist installation including a hoisting rope, a balance rope and a guide rope.

"suspension gear" mean all components necessary to effect a secure attachment between the hoisting rope and the conveyance.

"work platform" means a platform attached through suspension gear to the hoisting rope and used by persons performing work in a mine shaft.

"winze" (see shaft)

Shafts

Shaft Design 7.1.1 (1) A mine shaft shall

- (a) be of a design approved by a professional engineer,
- (b) be equipped with a means to guide each shaft conveyance and counterweight through the shaft to prevent contact with another shaft conveyance or counterweight or with any shaft furnishing,
- (c) have underwind clearances that exceed the stopping distance of any shaft conveyance when traveling at the maximum speed permitted by the hoist controls and carrying the maximum permitted load, except
  - (i) during shaft sinking operations, or
  - (ii) when chairs are used to land a skip during loading operations,
- (d) where a friction hoist is installed, be equipped with tapered guides, or other devices approved by a professional engineer, located above and below the limits of regular travel of any shaft conveyance or counterweight, and designed to decelerate and safely stop the shaft conveyance or counterweight in the event of overtravel, and
- (e) where a friction hoist is installed and where workers are transported in a conveyance not equipped with safety catches, safety chairs shall be installed in each compartment at the extreme limit of overwind travel; and the installation shall be so arranged so that if a conveyance or counterweights should break away from the rope as a result of an overwind, it would fall back the smallest practicable distance before landing on the safety chairs which, with their supports, shall be designed to stop and hold a fully loaded conveyance under these conditions.

Sump Barrier

(2) Except when a shaft is being sunk, or during sump cleaning operations, a barrier or obstruction shall be installed in the shaft to prevent a shaft conveyance from being lowered into water in the shaft bottom.

Guarding of Shaft Openings

7.1.2 A shaft opening in an underground mine shall be securely fenced, covered, or otherwise guarded.

Shaft Lining

7.1.3 (1) A shaft shall be securely lined and, if necessary, cased.

(2) During shaft sinking operations, the lining, and if necessary the casing, shall be maintained to within 20 m of the bottom of the shaft.

Shaft Compartments

7.1.4 (1) Except during shaft-sinking operations, a shaft compartment used for the handling of material shall be enclosed by a substantial partition at the collar and at all levels, except the side or sides on which material is loaded on or off the shaft conveyance.

(2) The enclosure referred to in subsection (1) shall

- (a) extend above the collar and each level a distance of not more than 7 m, or less than the height of the shaft conveyance plus 2 m,
- (b) extend below the collar and each level a distance of not less than 2 m, and
- (c) conform to the size of the shaft conveyance, allowing for necessary operating clearances.

Shaft Manways

7.1.5 (1) The manway in a shaft shall be separated from the hoisting or counterweight compartments by a partition which complies with section 7.1.5 (2).

(2) Between levels, the partition may consist of metal or other material of suitable weight and mesh to prevent

- (a) a falling object from entering the manway, or
- (b) the intrusion of an object from the manway into the hoisting compartment.

(3) A safe passageway and standing room for a person outside the shaft shall be provided at all workings opening into a shaft and the manway shall be directly connected with such openings.

Shaft Gates **7.1.6** (1) Except when the hoisting compartment at a shaft station is securely closed off, a substantial gate shall be installed.

(2) The gate required by subsection (1) shall be kept closed except when the shaft conveyance is being loaded or unloaded at the station, and have a minimum of clearance beneath it.

(3) The approach to the shaft shall be designed and protected to prevent inadvertent entry into the shaft of an uncontrolled vehicle.

Smooth Lined Shafts **7.1.7** A manway in a shaft shall be separated from the conveyance compartments by a mesh of suitable weight to prevent

- (a) a falling object from entering the manway, or
- (b) the intrusion of an object from the manway into the hoisting compartment.

Ladders in Shafts **7.1.8** (1) A suitable stairway or ladderway shall be maintained in every shaft.

(2) During shaft sinking operations, if the ladder is not maintained to the bottom of the shaft, an auxiliary ladder shall be provided.

(3) No ladder in a shaft, other than an auxiliary ladder used in shaft sinking operations, shall be installed in a vertical position.

(4) Where it is necessary for persons to perform inspections in a shaft, suitable ladderways, stairways, or platforms shall be provided to permit the work to be carried out in a safe manner.

Shaft Obstructions

7.1.9 (1) Protective devices and procedures shall be used to prevent a shaft conveyance from coming into contact with an intermediate shaft obstruction.

(2) A device which may become an intermediate shaft obstruction shall be positively locked out of the shaft compartment to prevent its inadvertent projection into the compartment.

(3) The location of each intermediate shaft obstruction shall be marked on the depth indicator of the hoist.

(4) The procedure for safely working with intermediate shaft obstructions shall be prepared in writing and posted in appropriate locations.

(5) Doors for covering the shaft at the collar, to facilitate the maintenance of a shaft conveyance, are not an intermediate shaft obstruction if

(a) they are positively latched out of the shaft compartments when not in use, and

(b) dual lights are installed to indicate to the hoist operator whether such doors are in or out of the shaft compartment.

Shaft Sinking

7.1.10 (1) When the vertical depth of a shaft below the collar exceeds 50 m during shaft sinking operations, including any preliminary underground development being carried out at the same time, a sinking bucket shall be provided for the transport of persons in the shaft.

(2) The sinking bucket shall be not less than 1.07 m high and designed in accordance with section 7.5.1 (1) and 7.5.1 (2).

(3) Where the distance between a head sheave and the shaft bottom exceeds 100 m, a crosshead shall be used with the bucket.

Sinking Crosshead

7.1.11 The crosshead shall

(1) land on at least two chairs at the bottom crosshead stop to prevent distortion,

(2) be attached to the rope by a safety appliance to ensure that the bucket is stopped if the crosshead should jam in the shaft, and
(3) be of a type that encloses the bucket, unless the shaft compartment is tightly lined and the bucket is barrel shaped.

Indicator Lights

7.1.12 Dual lights shall be installed within view of the hoist operator to indicate
(1) that the crosshead and the sinking bucket are descending the shaft together after leaving the dumping position, and
(2) whether the service doors or the dump doors are in or out of the shaft hoisting compartment.

Service Doors

7.1.13 During sinking operations, service doors shall be installed at the collar and at any other place in the shaft in order to cover the shaft compartments where the bucket is loaded or unloaded and the doors shall
(1) automatically latch out by mechanical means whenever removed from the hoisting compartment,
(2) be closed whenever a bucket is being loaded or unloaded with tools or other materials, and
(3) be closed whenever persons are entering or leaving the bucket, except where a closed crosshead is in use that provides equivalent protection for persons.

Dump Doors

7.1.14 During sinking operations, dump doors shall be installed at the bucket dumping position and arranged so as to:

(1) prevent a bucket from being dumped when the doors are in the open position,
(2) prevent any material from falling down the shaft when the bucket is being dumped, and
(3) automatically latch out by mechanical means whenever they are removed from the hoisting compartment.

Multi-deck Stages

7.1.15 Where a multi-deck stage is used for shaft sinking purposes, it shall be of a design approved by a professional engineer and constructed in accordance with that design.

Filling Bucket

7.1.16 A sinking bucket shall be filled so that no piece of loose rock projects above the level of its rim.

Riding in Bucket

7.1.17 Except during shaft maintenance and inspection operations, every person being transported by a bucket shall ride in the bucket when it is traveling above the bottom crosshead stopping point in the shaft.

Person in Charge

7.1.18 (1) The person authorized to give signals for hoist movement at a shaft sinking operation shall maintain proper discipline of persons riding in the bucket and enforce the permissible loading restrictions of the conveyance permit.

(2) No person shall obstruct the authorized person mentioned in subsection (1) from performing his duties.

Steadying Bucket

7.1.19 A bucket shall not be allowed to leave the top or bottom of the shaft until it has been steadied.

Lowering Bucket

7.1.20 A bucket being lowered to the shaft bottom shall be

(1) stopped at a distance of at least 5 m. and not more than 10 m. above the bottom of the shaft, and

(2) lowered slowly beyond this point only on a separate signal.

Blasting Precautions

7.1.21 (1) During sinking operations, on the first trip carrying persons down the shaft after a blasting operation

(a) the bucket shall not be lowered beyond a point less than 15 m above the blasting set or bulkhead, or beyond any point in the shaft where the health or safety of the persons could be endangered, and

(b) only a sufficient number of persons shall be transported as required to make a proper examination of the parts of the shaft that might have been affected by the blast.

(2) Beyond the point specified in subsection (1), the bucket shall be lowered slowly on signals given by the persons riding in the bucket.

Overhead Protection

7.1.22 During shaft sinking operations

(1) persons may be at the bottom of the shaft during the hoisting and dumping cycles of the bucket, and

(2) no work shall be done in a shaft while persons are in another part of the shaft below such work unless there is a securely constructed covering over a sufficient portion of the shaft to protect the persons below from the danger of falling material.

Permits

Mine Hoist Certificates

7.2.1 (1) No hoist shall be put into service unless a certificate has been obtained from the manufacturer of the hoist or from a professional engineer, certifying

- (a) the maximum rope pull,
- (b) the maximum suspended load, and
- (c) the maximum unbalanced load in the case of a friction hoist.

(2) No hoist shall be loaded beyond the maximum amount shown on the certificate required under subsection (1).

Mine Hoist Permit

7.2.2 Except for the purpose of testing before being put into service in a particular location, no mine hoist shall be operated without a letter of certification issued by a professional engineer, a copy of which shall be posted in the hoistroom and provided to an inspector.

Shaft Conveyance Permit

7.2.3 (1) No shaft conveyance shall be used without a valid shaft conveyance permit.

(2) A shaft conveyance Letter of Certification shall be obtained from a professional engineer and a copy posted in the hoistroom.

(3) A certificate shall be obtained for each shaft conveyance and counterweight showing its

(a) rated load, as certified by a professional engineer, and

(b) serial number, date of manufacture, and the name of the manufacturer.

(4) Each shaft conveyance and couterweight shall be recertified in accordance with subsection (3) every 5 years.

Commissioning Tests

7.2.4 (1) Commissioning tests shall be conducted on a new or reactivated mine hoisting plant to ensure compliance with the code.

(2) The results of such tests shall be recorded and a copy sent to an inspector.

(3) The person responsible for commissioning the mine hoisting plant shall be a professional engineer who shall certify the results of the commissioning tests.

(4) No mine hoisting plant shall be placed into operation prior to the successful completion of commissioning tests.

Maximum Number of Persons in a Conveyance

7.2.5 (1) Subject to subsection (2), the maximum number of persons that may be carried in a shaft conveyance shall be determined as follows

(a) where the clear floor area of the deck of a shaft conveyance is 1.86 square metres or less, there shall be at least 0.19 square metre for each person,

(b) where the clear floor area of a deck of a shaft conveyance is more than 1.86 square metres and less than 4.64 square metres, there shall be at least 0.16 square metre for each person, and

(c) where the clear floor area of a deck of a shaft conveyance is 4.64 square metres or more, there shall be at least 0.14 square metre for each person.

(2) The maximum number of persons that may be carried by a shaft conveyance shall not exceed 85 per cent of the maximum allowable weight of materials divided by 90 kg.

(3) No shaft conveyance shall be loaded with more than the maximum number of persons or weight of material specified in the shaft conveyance permit and a notice showing the specified limits shall be posted at the shaft collar.

Logbooks **7.2.6** The following logbooks shall be obtained and used for each mine hoisting plant

(1) Electrical Hoisting Equipment Record Book,

(2) Hoisting Machinery Record Book,

(3) Hoistman's Logbook,

(4) Rope Record Book, and

(5) Shaft Inspection Record Book.

Hoist Operator's Certificate **7.2.7** (1) The operator

(a) is the holder of a current certificate from a medical practitioner stating that he has been examined, and is fit to discharge the duties of a hoist operator, and

(b) is qualified and authorized to operate the hoist or, in the case of a worker being trained as a hoist operator, is under the direct supervision of a qualified and authorized person.

(2) The medical certificate shall expire one year after its date of issue.

(3) Notwithstanding subsection (2), a hoist operator who has suffered from an accident or illness that, in the opinion of the mine manager, might impair his efficiency shall obtain a medical certificate before returning to work.

(4) A record of all medical certificates shall be kept on file.

Headframes and Sheaves

Headframe Design

7.3.1 A shaft headframe, whether on the surface or underground, shall

(1) have the plans of the design certified by a professional engineer, and

(2) be of sufficient height to provide an overwind distance that exceeds the greater of twice the stopping distance of the shaft conveyance traveling at the maximum speed permitted by the hoist controls, or 3 m.

Sheave Certificate

7. 3.2 (1) Before a shaft rope sheave is used, a certificate shall be obtained from the manufacturer or from a professional engineer certifying,

(a) its maximum rated load carrying capacity,

(b) the diameter of rope for which it was designed,

(c) the maximum breaking strength of the rope for which it was designed, and

(d) the maximum amount of groove wear that shall be permitted.

(2) No shaft rope sheave shall be loaded beyond its maximum rated load carrying capacity or used otherwise than in compliance with the certificate required by subsection (1).

Rope and Sheave Grooves

7.3.3 The ratio of the diameter of the sheave groove to the diameter of the shaft rope shall be as required by section 7.6.1.

Sheave Construction

7.3.4 A shaft rope sheave shall
(1) be made of material that can safely withstand the ambient temperatures where it is installed,
(2) have a groove, or inserts with a groove, which is suitable for the rope being used, and
(3) bear a serial number and the date of its manufacture.

Sheave Shaft

7.3.5 The shaft of a sheave shall be non-destructively tested for flaws by a certified person before being put into service in a particular location, and after installation in accordance with section 7.9.7.

Ropes

Rope Attachments

7.4.1 (1) Each component of the suspension gear between a shaft conveyance or counterweight and a hoisting or tail rope, and any connections between shaft conveyances, shall have a static factor of safety of not less than 10.
(2) Components of a single suspension unit between a hoisting rope and a shaft conveyance shall not be welded.
(3) A shaft rope shall be attached to the suspension gear of a shaft conveyance or counterweight by a closed type device that cannot be inadvertently disconnected.

Rope to Drum Attachment

7.4.2 (1) In a drum hoist installation, the hoisting rope of a shaft conveyance or counterweight shall be attached to the drum of the hoist.
(2) There shall not be less than three rounds of rope on the drum of a drum hoist when the shaft conveyance is at the lowest point in the shaft from which hoisting is possible.

Trial Trips

7.4.3 When the attachments for a shaft hoisting rope are first installed, or reinstalled after dismantling, the following procedures shall be performed before the hoist is put into service

(1) two test trips of the conveyance or counterweight shall be made through the working part of the shaft, with the conveyance carrying its normal maximum load,
(2) the attachments shall be examined by a qualified person upon completion of the two test trips and any necessary adjustments made, and
(3) a record of the test trips, and any adjustments or examinations made, shall be entered in the Hoisting Machinery Record Book by the person or persons making the tests, examinations or adjustments.

Rope Test Certificate

7.4.4 (1) Before a shaft rope is initially installed,

- (a) a 2.5m representative sample shall be cut from the rope and sent for destructive testing to an acceptable testing laboratory
- (b) a shaft rope that has been in storage for more than 12 months shall be retested in accordance with subsection (a).
- (c) a test certificate is issued by the laboratory showing the actual breaking strength of the rope, the percentage elongation at failure and the results of torsion tests performed on individual wires.

(2) When the rope is installed, a copy of the Test Certificate is sent to the inspector with the appropriate pages from the Rope Record Book.

Rope Destructive Test

7.4.5 After a shaft rope has been in service for 6 months on a drum hoist, and at subsequent intervals not exceeding 6 months, the manager shall ensure that
(1) a 2.5 m length shall be cut off from the lower end of the rope above the clamps, the cut ends securely bound and the sample sent for a destructive test at an acceptable rope testing laboratory.
(2) a test certificate showing the information required by section 7.4.4 (1)(c) shall be obtained from the laboratory and forwarded without delay to the inspector.

Rope Electromagnetic Test

7.4.6 A qualified person, shall test each shaft rope throughout its working length with an electromagnetic rope testing device.
(1) within 6 months of being put into service and at subsequent intervals of not longer than 6 months, or
(2) at intervals shorter than 6 months if an extrapolation of previous test results indicates that the loss of breaking strength of the rope could exceed 10% before the next regular test, or
(3) at intervals of not longer than 4 months when the rope has been in service for more than 2 years.

Records

7.4.7 The date of every electromagnetic test carried out and the results obtained shall be entered in the Rope Record Book required by section 7.2.6.

Copy for the Inspector

7.4.8 As record of every electromagnetic test performed, including graphs and their interpretation, signed by the person making the interpretation, shall be sent to the inspector within 28 days of the completion of the test or, if the test indicates a loss of strength of the rope in excess of 7.5%, within 14 days.

Minimum Rope Diameters

7.4.9 The minimum nominal diameter of a hoisting rope shall be
(1) 16 mm (5/8") where a shaft conveyance or counterweight is supported by a single rope, and
(2) 13 mm (1/2") where a shaft conveyance or counterweight is supported by more than one rope.

Factors of Safety Drum Hoist Ropes

7.4.10 The factor of safety of a hoisting rope installed on a drum hoist shall not be less than
(1) 8.5 at the point where the rope is attached to the shaft conveyance when carrying its maximum permissible load, or to the counterweight,

(2) 5.0 at the point where the rope leaves the head sheave when the shaft conveyance is carrying its maximum permissible load or, the counterweight is at its lowest point of normal travel, and
(3) 7.5 at the point where the rope is attached to a skip or counterweight if the maximum material load being carried is accurately determined by weighing.

Factor of Safety Friction Hoist Ropes

7.4.11 The factor of safety of a hoisting rope installed on a friction hoist shall not be less than the greater of the value obtained from the formula 8.0 minus 0.00164 d, where d is the maximum length of rope, in meters, in the shaft compartment below the head sheave or the friction hoist drum, or 5.5.

Factor of Safety Balance Ropes

7.4.12 The factor of safety of a tail or balance rope shall not be less than 7.0.

Shaft Rope Record

7.4.13 Whenever a shaft rope is installed or removed from service the appropriate pages in the Rope Record Book required by section 7.2.6, shall be fully completed and a copy sent to the inspector.

Rope Not to Be Used

7.4.14 No rope shall remain in service as a shaft rope when its breaking strength is found to be less than the following percentage of the breaking strength shown on the pre-installation test certificate required by section 7.4.4(2)
(1) in any part of a hoisting rope, 90%,
(2) in any part of a multi-layer, multi strand balance rope, 90%, and
(3) in any part of a single layer, stranded balance rope, 85%.

Rope to Be Removed

7.4.15 Notwithstanding section 7.4.14, no rope shall remain in service as a shaft rope if
(1) the extension of a test piece of the rope has decreased to less than 60% of the original extension shown on the test certificate required by section 7.4.4(2).

(2) the number of broken wires, excluding filler wires, in any section of the rope equal to one lay length, exceeds 5% of the total number of wires in the rope, excluding filler wires, or
(3) the rate of stretch in a hoisting rope, installed on a friction hoist, shows a rapid increase in the normal rate of stretch recorded during its service.

Reporting Defects to Manager

7.4.16 (1) If, during any examination or test required to be carried out by Part 7 of the code a weakness or defect is discovered which could endanger the safety of any person, the matter shall be reported immediately to the manager and the hoisting equipment shall not be used until the necessary remedial action has been taken.
(2) If any examination or test reveals an unusual condition of a shaft rope, although not constituting sufficient reason for condemning the rope a more frequent level of examination shall be conducted until the rope is certified by a professional engineer.
(3) The unusual condition and results of the inspection shall be recorded in the Shaft Rope Record Book.

Conveyances

7.5.1 (1) All parts of a shaft conveyance or counterweight, when carrying the rated load, shall be capable of withstanding at least 4 times the maximum allowable design stress without permanent distortion.
(2) The maximum allowable design stress shall be established by good engineering Practice and include the effects of
(a) the weight of the conveyance or counterweight,
(b) the rated load,
(c) any impact load,
(d) any dynamic load.

(e) stress concentration factors,
(f) corrosion,
(g) metal fatigue, and
(h) dissimilar materials.

Worker Protection

7.5.2 Where a person performs work from the top of a shaft conveyance or counterweight, the manager shall ensure that there is provided a safe footing, and except when changing shaft guides, protection from falling objects.

Transport of Supplies and Equipment

7.5.3 (1) Shaft conveyances shall be equipped with devices for safely securing any equipment or supplies that are to be transported in the shaft.
(2) Whenever equipment or supplies are being transported in a shaft, they shall be loaded and secured so as to prevent them from shifting.
(3) When any material being transported in a shaft projects above the top of the shaft conveyance, the projecting portion shall be securely fastened to the shaft conveyance and not to the hoist rope.
(4) If equipment is slung underneath a conveyance or crosshead to be transported in a shaft, it shall be suspended in a manner to prevent its contact with any part of the shaft, its lining, or its furnishing.
(5) All components of a suspension system used to sling equipment underneath a conveyance or crosshead being transported in a shaft shall be capable of withstanding, without permanent deformation, at least 4 times the maximum allowable design stress determined in accordance with section 7.5.1 (2).

Transporting Persons

7.5.4 Except during shaft sinking operations, when a shaft exceeds 60 m in vertical depth a suitable shaft conveyance shall be provided for the transport of persons in the shaft.

Cage Requirements

7.5.5 A cage that is used for the transport of persons in a shaft shall

(1) where it is supported by a single rope or a single point of attachment, be equipped with safety catches and mechanisms as prescribed in section 7.5.10,

(2) except on any side with a door, be enclosed by steel sheet at least 3 mm thick or by material of equivalent strength,

(3) have a hood made of steel plate, at least 5 mm thick or of material of equivalent strength,

(4) have an internal height greater than 2.1 m,

(5) have a clearance at the door greater than 1.8 m, and

(6) where practical, have an exit in the roof, which can be opened from inside or outside the cage, through which persons can pass.

Cage Doors

7.5.6 The doors on a cage that is used to transport persons in a shaft shall

(1) be at least 1.5 m in height,

(2) be mounted and arranged so that they cannot be opened outward from the cage,

(3) be of solid construction except for a viewing window,

(4) be arranged so that they can be closed whenever persons or materials, other than rolling stock, are being transported in the cage,

(5) be installed so that there is only enough clearance at the floor to allow them to be readily opened and closed, and

(6) be of adequate strength to withstand normal shock loads.

Transport of Persons in Skip

7.5.7 Except when being used, to transport workers for shaft inspection, maintenance purposes, or when an emergency situation occurs, a skip shall not be used to transport persons.

(1) When a skip is being used to carry persons, the hoist shall

(a) be equipped with control devices that prevent the skip from being taken to the dump position and to the skip loading pocket, unless the controls for loading the skip with ore or waste have been locked out in accordance with section 4.11.2,

(b) not be permitted to travel in excess of one-half its normal speed and in no case shall the speed be permitted to exceed 5 m/s, and

(c) a skip shall have a suitable platform provided for transporting persons so as to prevent any part of the body protruding outside.

(2) The control devices of the hoist shall be designed and installed to fail to safety.

(3) An audible or visible signal that the control devices for the hoist are set in operation shall be given to persons entering a skip.

Fall Protection **7.5.8** The opening between the side of a shaft and the skip box over which a person must pass when entering or leaving the skip shall be closed off sufficiently to prevent a person from falling through the opening.

Signal Pull Cord **7.5.9** The shaft signal pull cord shall be located in a convenient place for the skip tender when persons are being transported in the conveyance.

Safety Catches **7.5.10** The safety catches on a cage or skip shall

(1) be of a type and design approved by a professional engineer,

(2) safely stop and hold a cage or skip carrying persons if the hoisting rope or its attachment should fail, and

(3) be subjected to, and successfully pass, free fall tests as prescribed in sections 7.5.11 and 7.5.12

(a) before the cage or skip is first used for the transport of persons, and

(b) before the cage or skip is used for the transport of persons after repairs to correct any defect or distortion of the safety catches and mechanisms.

Free Fall Tests

7.5.11 The free fall tests required by section 7.5.10 (3) shall be performed under the following conditions
(1) the cage or skip shall carry a weight equal to the maximum permitted load of persons carried and of any material permitted to be carried at the same time,
(2) the cage or skip shall travel at a speed equal to the normal hoisting speed when transporting persons, and
(3) the guides on which the test is made shall be representative of those in the shaft.

Free Fall Tests – Results

7.5.12 A free fall test shall be considered successful if
(1) the cage or skip is decelerated within 1 g and 3 g,
(2) there is no damage to the safety dogs or mechanisms,
(3) the safety dogs engage the guides continuously during deceleration, and
(4) calculations show that the safety dogs would stop the cage or skip when carrying its maximum permitted material load.

Free Fall Tests – Report

7.5.13 The results of a free fall test shall be submitted to an inspector and entered in the Hoisting Machinery Record Book.

Chairs

7.5.14 Chairs used for landing a cage shall be
(1) arranged to fall clear and remain clear of the shaft compartment when the cage is lifted off the chair,
(2) operable only from outside the cage, and
(3) so arranged as not to distort the cage.

Work Platforms in Shafts

7.5.15 (1) Where a work platform that is not a shaft conveyance is used to transport or support a person, it shall be designed by a professional engineer and built in accordance with the design.
(2) The manager shall prepare a written procedure for the use of a work platform in a shaft before putting it into service.

Hoists

Drum to Rope Ratio

7.6.1 (1) The ratio of a hoist drum diameter to the rope diameter shall be equal to or greater than

- (a) in the case of a drum hoist, 60 to 1 where the nominal rope diameter is 26 mm (1") or less, and 80 to 1 where the nominal rope diameter is greater than 26 mm (1"),
- (b) in the case of a hoist used for shaft sinking or for preliminary development work during shaft sinking, 48 to 1 where the nominal rope diameter is 26 mm (1") or less, and 60 to 1 where the nominal rope diameter is greater than 26 mm (1"), and
- (c) in the case of a friction hoist, 80 to 1 for stranded ropes, and 100 to 1 for locked coil ropes.

2) Subsection (1) (a) does not apply to a drum hoist installed and approved for use prior to the code coming into force.

Hoist Brakes Required

7.6.2 (1) No hoist shall be used for the transport of persons in a shaft unless it has at least two sets of mechanical brakes to stop and hold the drum from which persons are being hoisted or lowered.

(2) Each set of mechanical brakes shall

- (a) be capable of safely stopping and holding the drum when the shaft conveyance is carrying its maximum permitted load,
- (b) be arranged so that it can be independently tested,
- (c) be arranged to apply normal braking effort before any linkage or brake piston reaches a limit of travel, and
- (d) if of a drum type, be equipped with a device to give positive indication of tread wear or slack linkage, and prevent any movement of the hoist if predetermined limits are exceeded.

Brake Application

7.6.3 At least one set of mechanical brakes required by section 7.6.2 shall be designed and arranged to
(1) apply directly to the hoist drum, and
(2) apply automatically whenever the safety circuit of the hoist is interrupted and whenever the pressure in the hydraulic or pneumatic brake actuating system drops below normal.

Brake Control

7.6.4 The mechanical braking system of a hoist shall be arranged so that
(1) the brake is applied by a control lever that is pulled, unless there is a common brake and power lever,
(2) where brake weights are installed to provide braking force, they can be readily tested to ensure freedom of movement, and
(3) at least one set of hoist brakes is applied automatically if there is a loss of power to the hoist.

Hoist Drum Deceleration

7.6.5 (1) Subject to subsection (2), the brakes of a drum hoist shall be designed and arranged to decelerate the drum at between 1.5 and 3.7 m/s/s when braking is initiated by an interrupted safety circuit and the hoist is
  (a) normally used for transporting persons, and
  (b) operating in the normal full speed zone in the shaft.
(2) Subsection (1) does not apply to a drum hoist installed and approved for use prior to the code coming into force.

Brake Testing Required

7.6.6 The braking system of a hoist not normally used for the transport of persons shall be designed and arranged to safely stop and hold the shaft conveyance under all permitted conditions of loading and speed and in either direction of travel.

Foot-operated Brake

7.6.7 No hoist shall be equipped with a foot-operated brake.

Protective Circuits and Hoist Safety Devices

7.6.8 (1) No electric hoist, regardless of operation, shall be used unless it has a fail-safe, protective electrical circuit at a normal potential not exceeding 250 V and all safety circuits of the electric hoist shall be installed in accordance with CSA M421-00 Use of Electricity in Mines.

(2) The track limit switch shall be installed in each shaft hoisting compartment above the normal upper limit of travel, and so arranged and positioned that in the event of an overwind it will be operated directly by the shaft conveyance or counterweight to interrupt the hoist safety circuit and bring the hoist to a safe stop before the conveyance or counterweight or rope attachments can reach any permanent obstruction in the shaft or headframe.

Synchronization

7.6.9 A device shall be installed on each friction hoist to synchronize the position of the shaft conveyance with the safety devices driven from the hoist drum.

Electric Hoist - Requirement

7.6.10 Every electric hoist shall have a speed indicator if the normal rope speed exceeds 2.5 m/s and a device which gives a voltage reading proportional to the speed of the hoist.

Electric Hoists -- Safety Devices

7.6.11 All safety circuits of an electric hoist shall be installed in accordance with CSA M421-00 Use of Electricity in Mines.

Electric Hoists - Controls

7.6.12 Every electric hoist shall have

(1) a master controller that has a neutral or brake reset position,

(2) the brake operating levers arranged so that, after any interruption of the hoist safety circuit, power cannot be restored to the hoist unless the brake levers are in the brake-applied position, and

(3) accurate and sensitive safety controllers.

Safety Devices – Design and Adjustment

7.6.13 Every safety and protective device installed at a hoisting installation shall
(1) be designed and installed taking into account the environmental conditions at its operating location, and
(2) only be adjusted and maintained by a qualified and authorized person.

Indicators

7.6.14 A hoist shall be provided with depth indicators that continuously, accurately, and clearly show the hoist operator the position
(1) of a shaft conveyance and counterweight, if any,
(2) in an inclined shaft, of a change in gradient that requires a reduction in hoist speed,
(3) at which the overwind, underwind, and track limit devices are set to operate,
(4) of any intermediate shaft obstruction,
(5) of the limits of normal travel for the shaft conveyance and counterweight, if any, and
(6) of any collar doors, dump doors, and crosshead landing chairs.

Drum Requirements

7.6.15 No drum hoist shall have
(1) more than 3 layers of rope where the drum has helical or spiral grooving or does not have grooving,
(2) more than 4 layers of rope if the drum has parallel and half pitch grooving, and
(3) less than 3 dead turns of rope remaining on the drum when the conveyance or counterweight is at its lowest possible position in the shaft.

Drum Grooves and Flanges

7.6.16 (1) A cylindrical drum on a hoist shall be provided with
- (a) grooves that properly fit the rope in use, except that during shaft sinking operations and preliminary development work, a smooth drum may be used, and
- (b) flanges of sufficient height to contain all of the rope on the drum and of sufficient strength to withstand any loads imposed by the rope.

(2) Any conical portion of a hoist drum shall be provided with grooves to prevent the rope from slipping on the drum.
(3) A drum hoist and a sheave shall be arranged so that the rope coils properly across the face of the drum and winds smoothly from one layer to another without cutting into the rope layer beneath.

Brake/Clutch Interlock **7.6.17** (1) A clutch of a drum hoist shall be interlocked with the brake so that

(a) the clutch can be disengaged only when the brake of the drum is fully applied, and

(b) the clutch is fully engaged before the drum can be released

(2) The controls for engaging and disengaging a clutch shall be designed or equipped with guards to prevent their inadvertent operation.
(3) A band type friction clutch shall not be used.

Slack Rope Detection **7.6.18** Drum hoists shall be equipped with a device for detecting slack hoist rope.

Communications and Signaling

Cage Call System **7.7.1** Cage call systems shall be installed so that the signals are audible to the hoist operator and electrical components are installed as per CSA M421-00 Use of Electricity in Mines.

Hoist Signaling System **7.7.2** A signaling system shall be installed at every hoisting shaft to permit the person in charge of the shaft conveyance and the hoist operator to exchange hoist control signals.

Signaling System - Electrical Requirements **7.7.3** (1) The signaling system required by section 7.7.2 shall be supplied with power at a potential not exceeding 150 V from a transformer which does not supply any other equipment.

(2) If the primary voltage of the transformer exceeds 750 V
- (a) one conductor of the power supply shall be grounded, or
- (b) if the conductors are ungrounded, an isolating transformer with a one-to-one ratio shall supply power for the signaling system, and
- (c) a device shall be installed to indicate a ground fault.

(3) All metal parts of the signaling system which do not carry electrical current shall be grounded unless located not less than 2.4 m above the floor.

Multi-deck Stage Signals

7.7.4 A shaft signaling system installed on a multi-deck stage at a sinking operation shall be capable of providing a signal that is both audible and visible.

Radio Frequency Signals

7.7.5 A shaft signaling system using radio frequencies shall
(1) be tested to determine if there is any hazard to the use of blasting caps in the mine, and
(2) only be operated if precautions are taken to prevent the risk of an inadvertent or accidental detonation of any explosive material as a result of radiated energy.

Persons Authorized to Give Signals

7.7.6 (1) Only qualified persons authorized by the manager shall give any shaft signal other than the danger signal.
(2) Except during maintenance work, shaft sinking, or preliminary development work, or to recall a conveyance after a 5 bell release, no person shall give any shaft signal unless the shaft conveyance is located at the level from which the signal is being given.
(3) No person shall interfere in any way with the signaling arrangements.

Signaling System Operation

7.7.7 (1) A hoist shall not be moved on manual control unless

(a) the signal prescribed in section 7.7.9 has been given and returned by the hoist operator,
(b) at least 4 seconds have elapsed after the executive signal has been given, and
(c) if the hoist operator is unable to act within 30 seconds of receiving the executive signal, until a complete signal has again been received.

(2) Shaft signals shall be given in the following sequence
(a) cautionary,
(b) destination, and
(c) executive.

7.7.8 The prescribed code of signals set out in Appendix 7-1 of this part shall be used at every mine, and a copy of the signal code posted in every hoistroom, at the collar of the shaft, and at every working level or other landing in the shaft.

Special Signals

7.7.9 (1) Special signals in addition to , and readily distinguishable from, those prescribed in section 7.7.8 shall
(a) be used to designate hoist movements without interfering in any way with the prescribed signals, and
(b) be approved by the inspector.

(2) The special code of signals in use at a mine and an adequate description of their application shall be posted in the hoistroom, at the shaft collar, and at every working level of the shaft.

Voice Communications

7.7.10 A system for communicating by voice shall be installed and maintained to permit communication between persons at the collar of the shaft, the landing stations, and the hoistroom for the shaft.

Hoisting Procedure

Transport of Persons

7.8.1 Persons shall not be transported in a shaft conveyance that is simultaneously being used to transport ore, or other material, or when the cage doors are open.

Transport of Persons With Supplies

7.8.2 Where a multi-deck cage is in use, no persons shall be allowed to travel in the cage when it is loaded with supplies or rolling stock, except that persons may be carried on the top deck with the doors closed if

(1) the materials and rolling stock are loaded on another deck and adequately secured, or

(2) the combined load does not exceed 85% of the material load limit of the cage.

Transport of Persons With Personal Equipment

7.8.3 No persons shall be allowed to travel in a shaft conveyance when personal hand tools or equipment are being transported unless

1) they are adequately secured and guarded where necessary, and

2) the combined load does not exceed 85% of the material load limit of the conveyance.

Authorized Person in Charge of Conveyance

7.8.4 (1) Whenever persons are being transported in a shaft conveyance where the hoist is operated under manual control, there shall be a qualified and authorized person in charge of the conveyance at all times who shall

(a) maintain discipline whenever persons are riding in the shaft conveyance,

(b) enforce the specified load limits for the shaft conveyance, and

(c) notify the hoist operator if a heavy or an irregularly shaped load is being handled.

(2) Whenever persons are underground in a part of a mine served by a shaft hoist operated under manual control, the person in charge of the conveyance shall, when not riding in the conveyance, be available within sound of the shaft signals at all times.

Transport of Explosives **7.8.5** No person shall travel in a shaft conveyance that is carrying explosives, unless he is required to handle the material and there is adequate space for his safety.

Notice Showing Conveyance Capacity **7.8.6** A notice clearly showing the load restrictions for the weight of material and the number of persons to be carried in the shaft conveyance shall be posted at the shaft collar and all entrances to the shaft.

Compartment Entry Prohibited **7.8.7** No person shall enter a hoisting compartment of a shaft in which hoisting operations are being carried on, except to enter or leave a shaft conveyance in that compartment.

Hoisting Suspended During Shaft Work **7.8.8** (1) Except during shaft sinking operations and concurrent preliminary development work, no hoisting operations shall be carried out simultaneously with any other work in a shaft compartment or in that part of the headframe used in conjunction with it.

(2) Where such work is to be done, the person in charge shall warn the hoist operator on duty and make a signed entry in the Hoistman's Logbook.

Shaft Examination **7.8.9** (1) No person shall work in a shaft or in that part of the headframe used in conjunction with it unless the person is adequately protected from accidental contact with a moving shaft conveyance and the danger of falling material or rock.

(2) No loading pocket shall be equipped with doors, gates, or chains which are closed by positive pressure, and which may open if the supply fails and discharge material into the shaft.

(3) No person shall work in a shaft compartment, or in a place immediately adjoining the compartment, or in that part of the headframe used in conjunction with it while hoisting operations are being carried on in the compartment, except where

(a) the shaft conveyance is necessary for carrying out the work, or

(b) the person is engaged in filling skips at a loading station and is properly protected in a location having adequate dimensions for safely carrying out his duties, or

(c) the work is being performed in a separate compartment that meets the requirement of section 7.1.5 (2).

Automated Hoisting

7.8.10 (1) Where a hoist is being operated by automatic or semi-automatic control and no other means are available for getting persons out of the mine quickly, a qualified hoist operator shall be readily available to operate the hoist whenever workers are underground.

(2) A device that permits changing from manual to automatic control shall be installed on an automatic hoist and the device shall be located where it is readily accessible to the manual controls, and operated only by an authorized person.

Automatic Hoisting -- Location of Controls

7.8.11 (1) Where a hoist is designed to be operated automatically from controls located at shaft stations and inside the cage, the switch for effecting a changeover of the control made between the shaft station and the cage shall be effective only at the shaft station where the cage is stopped.

(2) Devices installed at shaft stations for selecting the cage destination and initiating hoist movement shall be effective only when the cage is stopped at that station.

(3) Except for jogging movements, a control located at a shaft station for initiating hoist movement shall be effective only when the shaft gate is closed.

(4) When an executive signal is given from a control at a shaft station, at least 5 seconds shall elapse before the hoist moves.

(5) Except for jogging movements, devices located inside a cage for initiating hoist movements shall be effective only when the doors of the cage and the shaft gates are closed.
(6) Where a control for initiating hoist movement is located inside a cage, a device shall be installed in the cage which can cause the hoist safety circuit to be interrupted in an emergency.
(7) If an emergency stop occurs during automatic or semi-automatic hoisting operations, an alarm shall sound and the hoist shall be operated manually until the reason for the emergency stop has been found and, if caused by a fault, until the fault has been corrected and the hoist operated for sufficient time to ensure that it is operating normally.

Brake, Overwind and Underwind Testing

7.8.12 (1) After going on shift, and before raising or lowering a shaft conveyance, the hoist operator shall ensure that each drum brake is capable of holding its maximum permitted load by testing it against the normal, full load starting torque of the hoist. The drum shall not be unclutched until the test has been made.
(2) At least once in each 24-hour period of hoist operation, test the overwind and underwind protective devices by slowly raising or lowering the shaft conveyance or counterweight into them.

Hoisting Stoppages

7.8.13 A hoist operator shall make a return trip of the shaft conveyance
(1) through the working part of the shaft after any stoppage of hoisting for more than 2 hours, and
(2) below any part of a shaft that has been under repair, after the repairs have been completed.

Hoist Operator's Responsibilities

7.8.14 A hoist operator shall
(1) remain at the hoist controls at all times that the hoist is in motion under manual control,

(2) not talk with anyone while the hoist is in operation under his control, except in an emergency and during shaft maintenance and examination,
(3) not operate the hoist to transport any person unless at least two brakes can be applied to safely stop the conveyance,
(4) not lower persons on an unclutched drum, and
(5) whenever he leaves the hoist controls, except when the hoist is put on automatic control, set the brakes and the controls so that at least two separate and distinct actions are required to put the hoist in motion.

Signals to Hoist Operator

7.8.15 (1) A hoist operator shall complete any hoist movement required by an executive signal without stopping unless he receives a "stop" signal or an emergency occurs.
(2) After receiving a 3-bell signal, a hoist operator shall remain at the hoist controls unless advised orally by the person in charge of the conveyance that hoist movement will not be required.

Hoist Operator to Attend to Hoist Only

7.8.16 A hoist operator shall not be required to look after any other machinery except with the approval of the chief inspector.

Hoisting Prohibition

7.8.17 No person shall
(1) operate or interfere with any devices or controls for operating a hoist unless qualified and authorized,
(2) speak to the hoist operator while he is operating the hoist on manual control, except in an emergency or when the hoist is being repaired, maintained, or adjusted and a notice to this effect shall be posted in the hoistroom,
(3) be on a cage while it is being placed onto or removed from chairs,
(4) be in, on, or under a shaft conveyance or counterweight which is supported by an unclutched drum unless the conveyance or counterweight is secured in position or unless permitted by section 7.1.22 (1), or

(5) leave a shaft conveyance that has inadvertently stopped at a point other than a shaft station, except upon instruction from a qualified and authorized person outside the conveyance.

Chairing Cage

7.8.18 Chairs shall not be used for landing a cage unless
(1) a signal for chairing has been given and returned, or
(2) special arrangements have been made to operate a cage with a car, in balance, from that location.

Object Falling Down Shaft

7.8.19 The normal operation of a hoist shall be suspended if an object, which may be a hazard to the operation of a shaft conveyance or counterweight, has fallen down the shaft until,
(1) a shaft inspection and a trial run through the affected part of the shaft have been made,
(2) any obstructions have been removed, and
(3) any damage affecting safe operation has been repaired.

Hoisting Procedures

7.8.20 (1) The manager shall issue written procedures for the safe operation of the hoist and have them posted in the hoist room.
(2) Every hoist operator shall be instructed in these procedures which shall include
  (a) operating the hoist where there is an intermediate shaft obstruction,
  (b) emergency procedures,
  (c) commencing hoisting operations after an inadvertent stoppage of the hoist, and
  (d) the operation of any man safety devices.

Inadvertent Stoppage of Hoist

7.8.21 (1) The manager shall develop procedures for removing persons from a shaft conveyance that has inadvertently stopped at a place in the shaft other than a shaft station.
(2) The person designated to be in charge of a shaft conveyance by virtue of section 7.8.4, shall be readily available and trained to carry out these procedures.

Signal Required

7.8.22 No hoist operator shall move a shaft conveyance without receiving a proper signal unless the conveyance has been inadvertently stopped at a point in the shaft other than a station from which signals can be given, and he has received instructions from a qualified and authorized person.

Record Keeping

Hoist Operator's Logbook

7.9.1 A hoist operator shall, each shift, enter in the Hoistman's Logbook
(1) the working condition of the hoist brakes, clutches, clutch-brake interlocks, depth indicators, hoist controls, signaling systems, overwind and underwind devices, and any other devices that may affect the safe operation of the hoist,
(2) any instructions he received and any unusual circumstances that occurred affecting the normal operation of the hoist,
(3) the results of any tests or trial trips made in compliance with the code, and
(4) a report of any inadvertent stoppages that occurred.

Hoist Operator's Entries in Logbook

7.9.2 A hoist operator shall
(1) before commencing to operate the hoist, review and countersign all entries in the Hoistman's Logbook for the preceding two shifts,
(2) enter in the logbook the time at which he commenced and finished his shift, and
(3) sign all entries made during the shift.

Hoist Operator's Logbook – Supervisor's Entries

7.9.3 (1) Any person issuing instructions to a hoist operator shall record and sign such instructions in the Hoistman's Logbook.

(2) Each working day, the supervisor in charge of a hoist shall review and countersign all entries made in the Hoistman's Logbook during the preceding 24-hour work period.

(3) The Hoistman's Logbook shall be kept in the hoistroom and be available for inspection at all times.

Rope Certificate **7.9.4** No shaft rope shall be used unless it is accompanied by a certificate from the manufacturer giving the following information

- (a) name and address of the manufacturer, coil or reel number, date of manufacture and type, length, and diameter of rope,
- (b) weight per unit of length, number of strands, number of wires in each strand, class of core, diameter of wires, breaking stress of steel from which the wire is made, and the results of torsion tests of individual wires, and
- (c) its breaking load as determined by actual tests at a recognized testing laboratory.

Record Book **7.9.5** (1) The rope data required by section 7.9.4 along with the additional following information shall be entered in a book known as the Shaft Rope Record Book.

(2) The following information shall be included; date of purchase, date installed, identification number, name of shaft and compartment in which the rope is used, weight of shaft conveyance, maximum weight of material carried, weight of maximum length of rope in service, and static factor of safety.

History of Shaft Rope **7.9.6** (1) The Shaft Rope Record Book shall contain a history of each shaft rope including

- (a) the date it was installed, shortened and removed, and reason for removal,
- (b) dates and summaries of destructive and non-destructive tests, and
- (c) certification of trial trips and examinations.

(2) The Shaft Rope Record Book shall always be available for inspection.

Non-destructive Tests: Hoisting Equipment

7.9.7 Without limiting section 7.4.6, every part of a hoist and hoisting equipment the failure of which could endanger persons, shall be subjected to an annual non-destructive test conducted by a certified person, and a copy of the test results shall be forwarded to an inspector.

Qualified Person to Be Appointed

7.9.8 The manager shall appoint a qualified person, or persons, to carry out the inspections prescribed in sections 7.9.9, 7.9.10, 7.9.11, 7.9.12 and 7.9.13 of the code.

Daily Inspection

7.9.9 At least once in each normal production day, an inspection shall be carried out of
(1) the exterior of each hoisting rope and tail rope to detect the presence of kinks or other visible defects and to note the condition of the rope dressing, and
(2) the cage safety catches for any visible damage or defects.

Weekly Inspection

7.9.10 At least once in each week, an inspection shall be carried out of
(1) all shaft conveyance safety mechanisms for proper adjustment, freedom of movement, and freedom from damage,
(2) all head, deflection and idler sheaves, and shafts and their bearer and sole plates,
(3) all rope attachments, shaft conveyance and counterweight attachments, and suspension gear,
(4) any shaft conveyance counterweight and work platform,
(5) all parts of the hoist that could affect its normal operation including the brakes, clutches, interlocks, depth indicators, and all safety devices,
(6) any hoisting equipment being used during shaft sinking operations, and

(7) any auxiliary brake operating weights to ensure that they move freely and have adequate holding capacity.

Monthly Inspection

7.9.11 At least once each month, an inspection shall be carried out of
(1) the shaft ropes to determine the amount of wear, distortion and corrosion, the need for lubrication, and the need for changing any wear patterns
(2) the hoisting ropes to determine the number of broken wires, and
(3) the friction treads on a friction hoist.

Six-monthly Inspection

7.9.12 At least once in every 6 months of service, an inspection shall be carried out of
(1) the hoisting rope on a drum hoist within the attachments at the drum and at the drum spout, and
(2) the hoisting rope of a friction hoist within the attachments at the shaft conveyance and counterweight in accordance with a procedure established by the manager.

Annual Inspection

7.9.13 At least once in every 12 months, an inspection shall be carried out of,
(1) foundation bolts, bolt locking devices, and all other bolts and fastenings that are critical for hoist safety, and
(2) the bails, suspension gear and structural components of every shaft conveyance and counterweight.

Testing Safety Catches

7.9.14 (1) A qualified and authorized person shall, at least once in every month, test the safety catches on a shaft conveyance by suddenly releasing the empty conveyance from rest so that the safety dogs have the opportunity to grip the shaft guides and hold the conveyance.
(2) At least once in each year, the safety catches shall be subjected to a quick release test with the conveyance carrying a load equivalent to the maximum allowable load for that conveyance.

(3) If the safety catches do not operate satisfactorily, the shaft conveyance shall not be used for the transport of persons until the necessary repairs have been made and the safety catches re-tested and found to be satisfactory.

Hoist Rope Maintenance

7.9.15 (1) Hoisting ropes in use on a drum hoist shall be cleaned when necessary and be dressed with lubricant at least once each month so as to maintain a good coating.
(2) The supervisor in charge of the work shall enter the date and sign a record of the rope cleaning and dressing in the Hoisting Machinery Record Book.

Special Requirements for Ends of Rope

7.9.16 After every eighteen months of service on a friction hoist, the portion of a hoisting rope or tail rope that is within a wedge and socket attachment shall be cut off unless that portion of the rope is visually examined by a qualified and authorized person and found not to have
(1) any broken wires, significant corrosion, or serious pitting, and
(2) any excessive deformation of the wires.

Hoisting Machinery Record Book

7.9.17 A record of all inspections and examinations carried out in compliance with Part 7 of the code on the hoisting equipment, and a record of all repairs and maintenance work done, shall be entered in the Hoisting Machinery Record Book and all entries shall be dated and signed by the person who performed the work.

Record of Mechanical Failures and Accidents

7.9.18 (1) A record of any failure or accident involving a mechanical part of a hoist installation shall be made in the Hoisting Machinery Record Book by the supervisor responsible for the mechanical parts of the hoisting plant.
(2) The supervisor responsible for the mechanical parts of the hoisting plant shall countersign each entry made in the Hoisting Machinery Record Book with respect to all examinations and inspections carried out in compliance with Part 7 of the code.

Electrical Inspections

7.9.19 (1) A qualified and authorized person or persons shall be appointed by the manager to examine, inspect, and test the electrical parts of an electrically powered or controlled hoist.
(2) The person or persons appointed shall, at least once each week, make an examination of the hoist motors, the hoist controls, the electrical safety devices, and the signaling system.
(3) A record of the examinations and of all repair and maintenance work carried out shall be made in the Electrical Hoisting Equipment Record Book.
(4) All entries in the Electrical Hoisting Equipment Record Book shall be dated and signed by the person performing the work.

Record of Electrical Failures and Accidents

7.9.20 A record of any failure or accident involving an electrical component of a hoist motor, a hoist control, an electric safety device, or the signaling system shall be made in the Electrical Hoisting Equipment Record Book by the supervisor in charge of the electrical parts of the hoisting equipment.

Hoisting Plant Supervisor's Responsibilities

7.9.21 The supervisor in charge of all of the hoisting plant and equipment shall
(1) at least once each week, review the entries made in the Hoisting Machinery Record Book and the Electrical Hoisting Equipment Record Book during the preceding week,
(2) ensure that all examinations and tests, required by Part 7 of the code, have been carried out and any necessary repairs or adjustments made, and
(3) upon completion of his review, certify in each record book that he has complied with subsections (1) and (2).

Shaft Inspection

7.9.22 A qualified and authorized person shall carry out an examination
(1) at least once every week, of each mine shaft,
(2) at least once every month, of the shaft guides, timbers, walls, and compartments used for hoisting.

(3) at least once every year, of the headframe, headframe foundations and back legs, sheave decks, dumps, bins, and bin supports,
(4) of the shaft sump at such frequency as is necessary to ensure that the tail, guide, and rubbing rope connections are clear of water and spillage, and
(5) at least once every year, of the water in the shaft sump to determine the pH value.

Record of Shaft Inspection

7.9.23 A record of the examinations required by section 7.9.22, and a record of all maintenance and repair work performed shall be entered in the Shaft Inspection Record Book and all entries shall be dated and signed by the person who carried out the work.

Supervisor of Shaft and Headframe Responsibilities

7.9.24 The supervisor in charge of the mine shaft and headframe shall
(1) at least once each week, review the entries made in the Shaft Inspection Record Book during the preceding week,
(2) ensure that all examinations and tests required by Part 7 of the code have been carried out and any necessary repairs or adjustments made, and
(3) upon completion of his review, certify in the Shaft Inspection Record Book that he has complied with subsections (1) and (2).

Appendix 7-1

Mine Shaft Signal Code

1 bell - Stop Immediately - if in Motion

1 bell - Hoist

2 bell - Lower

3 bell - Persons About to Enter or Leave Conveyance

(1) The 3-bell signal shall be given before persons are permitted to enter or leave the shaft conveyance.

(2) Where a return bell signal system is installed, the hoist operator shall return the 3-bell signal before persons are permitted to enter or leave the shaft conveyance.

(3) A hoist operator who has received a 3-bell signal shall remain at the hoist controls until receipt of the signal designating the movement required and completion of the movement.

(4) The hoist operator shall initiate a 3-bell signal as the shaft conveyance approaches the level.

4 bells - Blasting Signal

(1) The hoist operator shall answer a 4-bell signal by raising the shaft conveyance a few feet and then lowering it slowly.

(2) Following a 4-bell signal, only a one bell signal shall be required to signal for raising workers away from a blast.

(3) The hoist operator shall remain at the controls until the act of raising has been completed.

5 bell - Release Signal

The hoist operator on receiving a 5-bell signal may move the shaft conveyance to another point in the shaft, not a recognized stopping point and stop it there at his own discretion, but the person giving the release signal shall remain to guard the conveyance until it is moved.

9 bell - Danger Signal

This signal shall be given only in case of fire or other danger, and followed by the signal for the level at which the fire or other danger exists.

1 bell followed by 2 bell – Chairing

3 bell followed by 3 bell followed by 1 bell - Hoist Slowly

3 bell followed by 3 bell followed by 2 bell - Lower Slowly.

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PART 8

Definitions

"*blast danger zone*" means an area in which there may be a danger to any person or property from flying material, or any other hazardous condition resulting from a blast.

"*blaster*" means a person who is qualified under this part of the code to conduct blasting operations at a mine.

"*blasting agent*" means a relatively insensitive, ammonium nitrate explosive which includes and AN/FO mixture, emulsion, slurry, or watergel.

"*blasting machine*" means a device used to initiate a blast.

"*blasting certificate*" means a certificate issued under this part of the code which authorizes a person to conduct blasting operations at mines.

"*bootleg*" means a remnant of a blasthole that did not properly break when the blast was initiated.

"*collar*" in this part, means the start of a drilled blast hole.

"*detonator*" means a blasting cap, or other device used to initiate detonation of an explosive.

"*detonator house*" means a magazine used to store detonators.

"*explosive*" means any chemical compound or mixture which, when detonated, violently decomposes producing a large volume of gas at high temperatures capable of having destructive effects.

"*leg wires*" means the wires attached to an electric blasting cap used for initiating its detonation.

"*magazine*" means a building, storehouse, or structure where explosive materials are kept or stored but does not include containers used for transporting explosives or day storage boxes.

"*mishole*" "*(misfire)*" means a charge or part of a charge which, upon initiation, failed to completely detonate.

"*non-electric cap*" means a detonator which does not require an electric current to initiate its explosive charge.

"*primed cartridge*" means an explosive containing a detonator.

"*provisional blasting certificate*" means a blasting certificate issued by the manager, valid for a maximum of 90 days.

"*round*" means a number of charged blast holes to be fired in a specific sequence.

"*safety fuse assembly*" means a device to convey flame to a non-electric blasting cap. It consists of a train of black powder, tightly wrapped and enclosed with waterproof material, which burns continuously at a constant rate when ignited by means of an attached igniter cord connector.

Definitions - *Continued*

"*sensitive area*" means any area where the blast including blast vibration or air blast may have an adverse affect on fish or wildlife.

"*socket*" means a short stub of a drill hole commonly found after a hole has been blasted.

"*urban area*" means an area, within which there are residences or other structures that may be impacted by the adverse effects of a blasting operation

Magazines

Permit Required

8.1.1 The manager shall

(1) apply for and receive an Explosives Storage and Use Permit from the inspector before a magazine is located, erected, built, put into service, or modified, or before carrying out any maintenance work including the installation of lighting or heating, and

(2) ensure that the magazine meets the regulations and standards of the *Explosives Act* (Canada).

Magazine Location

8.1.2 (1) The manager shall select the site for a magazine in accordance with *Explosives Act* (Canada) and NRC Explosives Branch.

(2) The manager shall cease to use the magazine for the storage of explosives if the conditions under which the permit was issued are no longer valid.

(3) Upon taking a magazine out of service the manager shall

- (a) return to the inspector , by registered mail, the storage and use permit for the magazine taken out of service,
- (b) remove all explosives from the magazine, and
- (c) dispose of all unused explosives in a suitable manner.

Electrical Specifications

8.1.3 In every magazine the electrical equipment and wiring shall meet the requirements of CSA Standard M421-00 and NRCan "Storage Standards for Industrial Explosives.

Flammable Material **8.1.4** Gasoline, oil, or other flammable material shall not be stored in a magazine, or nearer to a magazine than the distance required by the Table of Distances in NRC Explosives Branch "Blasting Explosives and Detonators Storage, Possession, Transportation, Destruction and Sale," or as directed by the chief inspector.

Magazine Signs **8.1.5** All magazines must have suitable signs
(a) located in a manner that does not attract undue attention, and
(b) prohibiting open flames, or any ignition source including smoking within 10 metres.

Magazine Rules **8.1.6** Every magazine shall be operated and maintained in accordance with the NRC regulation and the following rules
(1) it shall be in the charge of a authorized person who shall carry out a weekly inspection of the magazine,
(2) it shall be locked at all times, except when explosives are being moved, and only the authorized person(s) are in possession of the key,
(3) it shall have an up to date inventory of its contents in a special logbook and all entries shall be signed by the authorized person in charge,
(4) it shall be kept clean, dry, and free from grit at all times,
(5) it shall be kept free of broken explosives packages or spilled explosives, and when necessary, the shelves and floors shall be treated with a suitable neutralizing agent to remove all traces of explosive substances,
(6) it shall have its contents arranged in a tidy and organized manner, including any explosives returned from a workplace,
(7) it shall not contain any exposed iron or steel except in fixtures, and
(8) stock shall be rotated, so for each type and size of explosive, the oldest stock is used first.

Posting Rules

8.1.7 A copy of the rules for magazine operation and maintenance, required by section 8.1.6, shall be posted inside every magazine.

Storage of Detonators

8.1.8 (1) Detonators shall be stored in a special, separate building designated as a "Detonator House", to which the rules for magazines required by section 8.1.6 shall apply.

(2) Detonators shall not be kept or stored with explosives or taken into any magazine containing explosives.

(3) In an underground mine with the permission of the inspector, detonators may be kept or stored in suitable, closed containers which shall not be placed closer than 10 m to any explosives except during transport or when priming.

No Smoking

8.1.9 No person shall smoke while handling, transporting or using explosives.

Underground Explosive Storage

8.1.10 In an underground mine, other than a coal mine

(1) A magazine for the storage of more than a 24 hour supply of explosives may be established with the written approval of the inspector.

(2) Explosive storage boxes, holding not more than a 24 hour supply, may be maintained in each working place without the permission of an inspector. The boxes shall be clearly marked "Explosives."

- (a) A current record of every magazine or explosive storage area shall be kept.

(3) A magazine, explosive container, or explosive storage area shall be

- (a) located at least 60 metres from a shaft, hoist room, main access ramp, refuge station, transformer vault or a fuel storage or fuel transfer area, and
- (b) located so that there is no possibility of a vehicle colliding with a storage container, and

(c) located so that in case of fire in the mine the explosives are not likely to become overheated, and

(d) conspicuously marked by "Explosives" sign or signs.

(4) Detonators are not to be stored within 8 metres of flammable explosives, and

(5) Where longhole blasts or similar blasting operations are being carried out, such quantities of explosives as can be loaded in a 24 hour period together with an amount that may be necessary to maintain that supply may be kept in a designated storage area that is not a magazine which is under the control of a authorized person.

Blasting Certificates

Blasting Certificate Required

8.2.1 (1) No person shall conduct, or be permitted to conduct, a blasting operation unless he holds a provisional or valid blasting certificate granted under this part of the code.

Uncertified Persons

(2) No person shall be granted a provisional or valid blasting certificate unless he is able to give and receive orders in the English language.

Assistance for Blaster

8.2.2 A person who does not hold a blasting certificate shall not prepare a blast, but a certificated blaster may be assisted by a reliable person not holding a blasting certificate. The blaster shall ensure that the person assisting him remains under his supervision.

Provisional Blasting Certificates

8.2.3 A provisional blasting certificate, valid for a period not exceeding 90 days, may be granted by the manager, on a one time basis, and a copy of the certificate shall be sent to the inspector.

Blasting Certificate Examination

8.2.4 An applicant for a blasting certificate shall pass a written examination, and satisfy the inspector that he is qualified to perform the duties of a blaster.

Certificate Restrictions

8.2.5 (1) A blasting certificate may contain any restriction deemed necessary by the inspector.
(2) The blaster shall deliver his certificate to the manager when he commences employment at the mine and the manager shall return it to the blaster when his employment is terminated, unless the certificate has been suspended under section 8.2.6 or 8.2.7.
(3) The blasting certificate shall be valid for a period of 5 years.

Blasting Certificate Suspension by Manager

8.2.6 The manager shall suspend a person from working with explosives if, in his opinion, the person fails to comply with any section of the code related to blasting, commits a careless act with explosives or detonators, or is unfit to perform his duties as a blaster, and the manager shall notify the inspector of the suspension without delay.

Blasting Certificate Suspension by Inspector

8.2.7 An inspector may suspend or cancel a blasting certificate if, in his opinion, the holder fails to comply with any section of the code related to blasting, commits a careless act with explosives or detonators, or is unfit to perform his duties.

Use, Care and Handling of Explosives

Acceptable Explosives

8.3.1 Explosives used in a mine shall be licensed, as per the *Explosives Act* (Canada), and they shall be used in accordance with the manufacturers recommendations.

Identification of Explosives

8.3.2 All explosives shall have plainly marked or printed on the exterior of every original package.
(1) the name and place of business of the manufacturer and the date of its manufacture,
(2) the type and strength of the explosive, and the dimensions of the cartridge,

(3) the UN classification number and the dangerous goods classification, and
(4) when full cases of detonators, detonating cords, and boosters are received, the inner cartons are immediately marked with the magazine license number.

Opening Containers

8.3.3 Only implements made of non-sparking material shall be used to open cases containing explosives.

Defective Explosives

8.3.4 Any explosives believed to be defective shall
(1) if in a workplace, be immediately removed,
(2) be reported to the manager and the inspector, and
(3) be destroyed in a safe manner in accordance with the manufacturer's recommendations.

Safety Fuse Assemblies

8.3.5 The manager must provide a written procedure for the use of safety fuse.

Frozen Explosives

8.3.6 Frozen explosives shall not be loaded until the product has been thawed in a manner recommended by the manufacturer. They shall not be warmed near an open fire or a steam boiler, nor by direct contact with steam or hot water.

Blasting Heated Rock

8.3.7 Where the temperature of the rock or material to be blasted exceeds 65 degrees Celsius, the manager shall ensure that special procedures and precautions are developed and these procedures shall be forwarded to the OHSC.

Transporting Explosives

8.3.8 Explosives and detonators
(1) shall be carried or transported in the manner prescribed in this code, and
(2) if not used, shall be returned to the magazine or storage box, and shall not be hidden in or about the mine.

Careless Acts

8.3.9 (1) No person shall

(a) commit a careless act with explosives or detonators, or

(b) having discovered that such an act has been committed, neglect or omit to report immediately the incident to the shiftboss, who shall report the matter forthwith to the manager.

(2) The manager shall report the offence, without delay, to the inspector and to the OHSC.

Blasters Medical Surveillance

8.3.10 Blasters that are continually handling nitro-glycerine based explosives shall have a medical examination on a frequency of less than 3 year intervals to determine sensitivity to and any harmful health effects from the continued exposure to nitro-glycerine.

8.3.11 Electric detonators shall not be used when extraneous currents (stray currents) exceed 50 milliamps (.05 amps).

Transportation of Explosives

Supervision by a Competent Person

8.4.1 (1) Only a person authorized by the manager, shall remove explosives from a magazine and transport them to a workplace, and such a transfer shall be made without undue delay.

(2) No person shall smoke or have open-flame lights within 10 m of a vehicle transporting explosives.

Vehicle Requirements

8.4.2 A vehicle used to transport explosives shall

(1) have a separate compartment for the explosives which prevents them from coming into contact with any metal that could produce a spark.

(2) be constructed so that the explosives cannot fall from the vehicle.

(3) when carrying explosives, be provided with orange diamond-shaped placards and clearly visible signs marked "Explosives" in letters not less than 150 mm in height which are posted on the front, rear, and sides of the vehicle,
(4) not be refueled when carrying explosives, except in an emergency,
(5) have its engine shut off while loading or unloading explosives except where the vehicle uses an engine-powered device for loading and unloading the explosives,
(6) only be operated by an authorized person, and
(7) be equipped with suitable fire extinguishing equipment.

Transport of Detonator

8.4.3 A vehicle used to transport explosive material at a mine shall only carry detonators when the detonators are separated from other explosives by a solid partition of wood 15 centimetres thick and extending at least 15 centimetres above the highest level to which explosives are packed in the vehicle.

Transport by Locomotive

8.4.4 When explosives or detonators are being transported by means of a locomotive they shall
(1) not be carried on the locomotive,
(2) be protected from any trolley wires, batteries or other hazards, and
(3) not be transported in front of the locomotive unless a worker walks in front to effectively guard them.

8.4.5 The person in charge of moving explosives or detonators to a headframe for transporting underground shall, immediately before doing so, notify the hoist operator, the deckman, and the cage tender.

Separate Containers

8.4.6 Explosives and detonators shall be transported in separate containers.

Loading and Priming

Care in Loading

8.5.1 (1) Only loading tools made of non-sparking materials shall be used.
(2) Explosive shall not be loaded into a hole
(a) of insufficient size, or
(b) by hitting, pounding, ramming, or applying undue pressure.

Cartridge Wrapper

8.5.2 Cartridge explosives shall not be removed from their wrappers except for water-gel or emulsion explosives that are to be used for blasting oversize rock or bringing down hung-up material.

Priming Nitro-glycerine Explosives

8.5.3 Primers shall be made up only as required and, when priming with nitro-glycerine type explosives, only a non-sparking implement shall be used to punch a hole in the explosive.

Priming Detonating Devices

8.5.4 Every primed charge shall
(1) contain a properly prepared detonating device sufficient to initiate the explosion reliably,
(2) have the detonator inserted into the cartridge in such a manner that it cannot be separated or pulled out of the cartridge during the loading operation, and
(3) be fired electrically or by approved non-electric means acceptable to the inspector.

Carrying Capped Fuses

8.5.5 A person may carry capped fuses with explosives from the nearest storage place to a point of use, without placing them in a container, provided that they are kept separate from each other. In no case, however, shall primed cartridges be transported.

Pneumatic Loading

8.5.6 Pneumatic loading of explosives into blastholes shall only be carried out
(1) with explosives licensed for that purpose, as per the *Explosives Act* (Canada), and

(2) where the procedures and equipment used will prevent any dangerous build-up of static electricity or hazards from stray electric currents.

8.5.7 The written approval of an inspector shall be obtained before any pneumatic loading of explosives is carried out over the leg wires of detonators.

Extraction of Explosives

8.5.8 No person shall extract, or attempt to extract, any primer or explosives of the nitro-glycerine type from a loaded blasthole.
(1) Explosives of the ammonium nitrate type may only be removed from a blasthole by washing.
(2) Insensitive water-gel or emulsion type explosives may be blown out of a blasthole by an authorized person using moderate air pressure and a blowpipe made of non-sparking material.

Vehicles Prohibited

8.5.9 A blast area shall be clearly identified by posted signs to prevent the inadvertent access of vehicles.

8.5.10 No equipment shall be allowed within 8 m of any charged blasthole except
(1) authorized explosives vehicles,
(2) explosive vehicles which have the exhaust directed above the cab of the vehicle, and
(3) other equipment authorized in writing by the chief inspector.

Firing Explosives

Time for Blasting

8.6.1 The time for blasting shall be set so as to protect persons from exposure to dust, fumes, and smoke.

Guarding

8.6.2 Before blasting, the blaster, or person designated responsible for blasting, shall
(1) clear the blast danger zone of all persons,

(2) ensure that all entrances to the blast danger zone are guarded to prevent access, and not rely only on signs for the purpose, and

(3) when blasting on the surface of a mine, ensure that an effective audible warning is given.

Firing Procedure

8.6.3 (1) Every charged hole shall be fired in its proper sequence, and where any blast could affect other charged blastholes, all of the holes shall be fired in one operation.

(2) When required, a waterspray shall be used during blasting of development headings.

Waiting Time

8.6.4 (1) A blaster shall allow sufficient time between blasts in an underground mine for

- (a) the heading, or other workplace, to be cleared of fumes, and
- (b) the broken rock to cool sufficiently so that there is no danger when it is being loaded.

(2) A worker shall not return, or be permitted to return, to a workplace after a blasting operation until the worker is sure that the gases produced by the explosives have been removed or diluted to a "safe degree" by the ventilation system. If the worker has reasonable grounds to believe that this has not been achieved, the worker shall request the shiftboss to test the air with a suitable instrument and explain the results to the worker.

Reporting Misfires

8.6.5 A blaster shall

(1) when possible, count the number of shots exploding,

(2) report to the shiftboss if he believes that any shot did not fire, and

(3) identify any misfired hole by inserting a conspicuous, non-metal marker at its outer end, or by roping the area off or by any other manner approved by the shiftboss.

Misfires

8.6.6 In the event of a misfired shot, the shiftboss shall
(1) determine the location, direction and depth of any hole necessary for blasting the misfired shot, supervise its drilling, and
(2) record in the daily examination and report book, the location of any misfired shot remaining at the end of the shift.

Raising and Sinking

8.6.7 Blasts shall be fired from a remote location during sinking operations, and when raising has exceeded 10 m or when required by the inspector.

Procedures for Explosives and Accessories

8.6.8 Written procedures shall be established for the use of all explosives accessories and blasting machines following the manufacturer's recommended specifications.

Blasting Machines

8.6.9 (1) All blasting machines shall be suitable for their applications, kept in a cool, dry, storage place and maintained in serviceable condition, in accordance with the manufacturers recommendations.
(2) The power output of every electric blasting machine shall be tested by an authorized person, in the manner prescribed by the manufacturer, at least once each month, and immediately before being returned to use after having been taken out of service.
(3) The results of the tests carried out in compliance with subsection (2), shall be entered in a logbook, dated, and signed by the authorized person who made the tests.

Condenser Discharge Machines

8.6.10 Condenser discharge machines shall be examined to ensure that any residual charge remaining on the capacitors after use is discharged in accordance with the manufacturer's instructions.

Connection to the Blast Circuit

8.6.11 (1) A blasting machine shall not be connected to the blasting cables until immediately before firing the charges.

(2) A blasting machine shall be immediately disconnected from the blasting cables after firing or attempting to fire the charges.

Blasting From Power Lines

8.6.12 (1) Electric power from lighting or power circuits shall not be used for firing charges unless

- (a) the blasting circuit has an isolating transformer, and
- (b)a special firing device that opens the blasting circuit by gravity is used.

(2) The blasting circuit conductors between the firing device and the blast site shall be No. 12 AWG, or better, and readily identifiable as blasting cable.

(3) Where expendable connecting wire is used, it shall not be less than No. 20 AWG.

Blasting Switches

8.6.13 Every electric power line blasting switch shall

(1) have the live side of the device installed in a box which is fixed, locked, and accessible only to the blaster, and

(2) incorporate a lightning gap of at least 1.5 m between the blasting switch and the service switch. This gap shall only be closed by a twist-type plug and cord assembly immediately before firing.

Branch Circuits

8.6.14 Where a blasting circuit is used for more than one working place, each branch circuit shall be isolated by means of a locked isolating switch that automatically short circuits the branch circuit.

Circuit Testing

8.6.15 Where more than one shot is fired electrically, the blaster shall test the electrical circuit with an approved circuit testing device immediately before blasting.

Electric Storms

8.6.16 The manager shall ensure that persons engaged in blasting operations underground are warned of an electric storm.

8.6.17 A blaster shall not connect an electric blasting circuit during an electrical storm. Once an electric blasting circuit is connected, and should an electric storm occur, all persons shall be withdrawn to a safe distance from the blast site. Access to the blast site shall be guarded until the storm has passed.

Radio Transmitters

8.6.18 The blaster shall ensure that signs are posted to ensure mobile radio transmitters shall be turned off when within 20 m of a site where an electric blasting system has been connected.

Blasting Cables Near Electrical Conductors

8.6.19 Blasting circuit conductors shall be kept at least 150 mm away from power and lighting cables and from any other electrical conductors.

Blasting Lead Wires

8.6.20 All blasting circuit conductors leading to a blasting site shall be insulated and, except when firing the blast, shall be short circuited.

Return to the Work Area

8.6.21 When blasting by electricity, the blaster shall not enter, or allow any other person to enter the area until
(1) the firing cables have been disconnected from the firing device and short circuited, or
(2) in the case of a blasting operation using a power or lighting circuit, the switches of the blasting circuit have been locked in the open position.

Firing in Multiple Work Places

8.6.22 Blasting cables or wires that have been used for blasting in one workplace, shall not be used for blasting in another workplace until all proper precautions have been taken to ensure that the blasting cables or wires have no electrical connection with the leads from the first workplace.

Central Blasting

8.6.23 A written summary of the procedure to be followed and a layout of the system shall be submitted to an inspector for approval before a central blasting system is used or modified. The procedure shall include a provision for post blast inspection.

Drilling Near Explosives

Misfired Holes and Bootlegs – Drilling Precautions

8.7.1 Drilling shall not be carried out
(1) within 300 mm of a bootleg on the surface or within 150 mm underground, or
(2) where any part of the hole to be drilled could come within 5 m of a hole containing explosives unless it is drilled under the direct supervision of a shiftboss to clear a blocked hole, or to place an additional hole for blasting a misfired charge in accordance with section 8.6.6 (1).

8.7.2 (1) Notwithstanding section 8.7.1 the manager may develop procedures for drilling within 300 mm of a bootleg or a hole containing explosives on the surface or within 150 mm underground.
(2) The manager shall submit these procedures to the inspector and to the OHSC at least 15 days in advance of implementing these methods and procedures.

Drilling in Loose Rock

8.7.3 No person shall drill in a loose rock produced by blasting unless
(1) the rock has been thoroughly examined to ensure that it does not have any holes containing explosives, or
(2) an engineered offset pattern is utilized to prevent overlaying of holes, and
(3) if a hole containing explosives is discovered, the drilling shall be carried out in accordance with section 8.6.6 (1).

8.7.4 Where it is impracticable to make the examination required by section 8.7.3 (1), or use an offset pattern as per 8.7.3 (2), a remotely controlled drilling procedure shall be employed.

Misfires

Surface Misfires

8.8.1 (1) A misfired hole on the surface shall be clearly marked off for a distance of 8 m around the collar of the hole.

(2) The use of equipment shall be restricted within this 8 m distance except as provided in section 8.7.1, or under a procedure approved by the inspector.

Time to Return

8.8.2 No person shall return or be allowed to return to the scene of a blast until the following times have elapsed

(1) when a blast is initiated with safety fuse assemblies, after a number of minutes equal to 7 times the number of metres in the longest fuse used,

(2) when safety fuse is involved and a misfire occurs, or is suspected, and after a reblast, a minimum of 30 minutes, and

(3) when no safety fuse is involved and a misfire is suspected, or when two or more detonators are used and the blaster cannot visually establish that all shots have fired, a minimum of 10 minutes from the time the blasting cable was disconnected and short circuited.

Inspection Before Abandoning

8.8.3 The shiftboss shall ensure that an underground development heading is not abandoned, or work discontinued, until material broken in the last round has been cleared from the face of the heading and the face has been examined for holes or sockets containing explosives.

Removal and Disposal

Removal of Explosives

8.9.1 No person shall take away or attempt to take away explosives, detonators, or fuse from a mine except as provided for in sections 8.9.2 and 8.9.3.

8.9.2 Explosives shall be removed or destroyed prior to the closure of a mine.

8.9.3 Section 8.9.1 does not apply
(1) to an explosive plant at a mine, operated under a licence issued by the Explosives Branch, E.M.R. (Canada), or
(2) if explosives are being returned to a registered explosives vendor, or
(3) if explosives are taken from the mine for a purpose authorized by the inspector.

Adjacent Workings

Blasting at Adjacent Mines

8.10.1 Where parties are working on adjacent surface mines or underground mines having connected workings, they shall agree to a mutually acceptable blasting time and procedure.

Connection to Existing Workings

8.10.2 When an active heading is within 8 m of another mine opening or drill hole, the shiftboss shall before any round is fired
(1) make a thorough examination of the other mine opening, drill hole collar or the nearest point of intersection,
(2) satisfy himself that the heading can be advanced in a safe manner, and
(3) ensure that any access to the nearest point of intersection with the other opening or drill hole is guarded.

Underground Coal Mines

Permitted Explosives

8.11.1 Only explosives authorized by the chief inspector, shall be taken or used, underground in a coal mine.

Mines Subject to Outbursts

8.11.2 Explosives shall not be used in any part of an underground coal mine liable to outbursts of flammable gas without the written permission of the inspector.

Non-combustible Stemming

8.11.3 In an underground coal mine, all charged shot holes shall be stemmed with a suitable non-combustible material before they are fired.

Taking Explosives Underground

8.11.4 In an underground coal mine, explosives shall not be
(1) stored or kept in the mine, except when required for rockwork, or when millisecond delay detonators are used and then only with the written permission of the inspector, and
(2) taken into the mine, except in an explosive container approved by the inspector, holding not more than 2 kg of explosives.

Procedures for Shot Firing

8.11.5 When explosives are used in an underground coal mine, the blaster shall
(1) check that each hole is properly drilled and thoroughly cleaned,
(2) examine the area within 25 m of the hole to verify that it has been adequately treated with an approved incombustible dust, that the ventilation is normal, and that the level of flammable gas is less than 1%, and
(3) after firing the shots, inspect the area, including any electric cables, to satisfy himself that conditions are safe before allowing any other persons to enter the area. The blaster may be accompanied by one other person while carrying out the inspection.

Drilling for Reblasting

8.11.6 When a charge has misfired in a coal mine and another hole is required for reblasting, the shotfirer shall be responsible for directing the angle of the new drill hole, which shall be not less than 650 mm from the original hole.

Lighting and Power Circuits Not to Be Used

8.11.7 When shotfiring in an underground coal mine
(1) current from lighting or power circuits shall not be used for firing shots, and
(2) electric power shall be cut off to the workplace when shots are being fired and not switched on again until the inspection required by section 8.11.5 (3) has been completed.

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Definitions

"acid rock drainage (ARD)" means low pH surface or ground water that results from the oxidation of sulphide minerals or, elemental sulphur, or the dissolution of acid generating minerals found in rocks and coal.

"bridge" means a temporary or permanent structure carrying an exploration access above a stream or other topographic depression.

"clearing width" means the width required to be cleared of standing timber to accommodate exploration access construction, maintenance and use.

"community watershed" has the same meaning as defined in the *Forest and Range Practices Act.*

"culvert" means a transverse drain pipe or log structure buried below the exploration access surface.

"deactivation" means stabilization of an exploration site or exploration access when active use of the site or access is suspended seasonally or for other reasons for a period up to 3 years or longer if approved by an inspector.

"deleterious substance" means any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man or fish that frequent that water.

"exploration access" means trails and roads constructed, modified, excavated, bladed or created through frequent use including any associated structures.

"exploration activities" are those activities which are undertaken in the search for and development of coal and minerals, as defined in the *Mineral Tenure Act*, with the exception of placer minerals:

(a) and include
   (i) disturbance of the ground by mechanical means such as drilling, trenching and excavating;
   (ii) blasting;
   (iii) construction, modification, deactivation and reclamation of an exploration access and camps;
   (iv) induced polarization surveys using exposed electrodes; and
   (v) site reclamation.

(b) but do not include

(i) prospecting using hand tools;
(ii) geological/geochemical surveying;
(iii) airborne geophysical surveying;
(iv) ground geophysical surveying without the use of exposed, energized electrodes;
(v) hand trenching without the use of explosives; or
(vi) establishment of exploration grid lines that do not require the felling of trees, with the exception of trees and shrubs that create a hazard to safe passage and danger trees as defined in the Workers' Compensation Board Regulation.

"fish passage" means the movement of fish at all life stages consistent with the natural state of fish streams.

"fish stream" means all streams, unless,

(a) a report from a qualified professional or technologist with adequate training or knowledge of fish habitat determines that the stream is a non-fish bearing stream, or
(b) the stream has been identified in a fish inventory carried out in accordance with the Ministry of Forests' publication "Fish Stream Identification Guidebook", as amended from time to time, as not containing any fish, or
(c) the stream is located upstream of a known barrier to fish passage, identified on a fish and fish habitat inventory map, where all reaches upstream of the barrier are simultaneously dry at any time during the year and no perennial fish habitats occur in any part of the upland drainage.

"reach" means a portion of a watercourse that has a consistent channel width, morphology and gradient.

"regionally significant wildlife habitat" means those site specific habitats identified through formal government processes as requiring special management attention.

"riparian setback" means an area of land adjacent to a stream, wetland or lake of a width defined in Table 9.1.

"road prism" means cross-section of the ground containing the exploration access surface, including the cut and fill slopes.

"soil" means the naturally occurring, unconsolidated mineral or organic material that is capable of supporting plant life.

"stream" means any naturally occurring reach flowing on a perennial or seasonal basis with a continuous channel bed and banks, whether or not the bed or banks of the reach are locally obscured by overhanging or bridging vegetation or soil mats, if the channel bed

(a) is scoured by water, or
(b) contains any material collection of inorganic alluvium deposited by water.

"stream width" means the horizontal distance between stream banks on opposite sides of the stream measured
(a) at right angles to the general orientation of the banks, and
(b) between the points on each bank indicated by a definite change in vegetation and sediment texture marking the normal annual flood level and sometimes shown by the edges of rooted terrestrial vegetation.

"temporary bridge" means a bridge whose expected life at its current location is 15 years or less.;

"wetland" means an area of 0.25 hectares or greater, unless a smaller area is identified as regionally significant wildlife habitat, that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in wet or saturated soil conditions.

Application

9.1.1 This part applies to persons engaged in mineral and coal exploration activities under the authority of the *Mines Act*.

Notice Requirements

9.2.1 (1) Prior to undertaking proposed exploration activities and pursuant to section 10 of the *Mines Act*, a Notice of Work as prescribed by the chief inspector shall be submitted to an inspector and shall include
(a) information required pursuant to the *Mines Act* and Code and any additional information as may be prescribed by an inspector,
(b) maps and schedules of the proposed exploration activity, applicable land use designation, up-to-date resource inventory and tenure information which is available from Provincial agencies 30 days prior to the time of application, and
(c) details of actions designed to minimize any adverse impacts of the proposed activity.

9.2.1 (2) A copy of all permits and authorizations issued with respect to the exploration activities shall be maintained at the exploration site while exploration activities are taking place.
(3) An annual summary of exploration activities, as prescribed by the chief inspector, shall be submitted by March 31.

Health & Safety

First Aid **9.3.1** In addition to complying with the emergency preparedness provisions of Part 3 of the Code
(1) active exploration sites of mechanical disturbance shall be equipped with a minimum Level-2 first aid kit, a stretcher and an epinephrine auto injector, and have provision made for continuous and consistent emergency communication, and
(2) at exploration drill sites, at least two members of the drill crew shall have a valid Worker's Compensation Board Level 1 or equivalent first aid certificate unless the work site is accessible in all weather conditions and within 5 minutes of a facility where there is a qualified first aid attendant.

Training **9.3.2** All persons employed at an exploration site shall be trained in accordance with Section 1.11, including where applicable
(a) safety with respect to wildlife,
(b) wearing of appropriate clothing,
(c) use of personal protective equipment,
(d) need for and use of suitable equipment to avoid becoming lost,
(e) safety procedures to be adopted for boat handling operations, and
(f) safe practices when working in or around aircraft, including effective communication.

Pits, Trenches & Excavations

9.3.3 (1) No person shall be permitted to enter any excavation over 1.2 metres in depth unless

(a) the sides of the excavation are sloped to a safe angle down to 1.2 metres from the bottom of the trench, or

(b) the sides have been supported according to the requirements of Part 4 of this Code.

(2) When it is required for persons to enter an excavation the minimum width of an excavation shall be such that a person is able to turn around without coming into contact with the sides.

(3) Excavated material shall be kept back a minimum distance of 1 metre from the edge of any trench. excavation, and 1.5 metres from any other excavation.

(4) A qualified person shall inspect an excavation immediately before any person is allowed to enter, and any hazard shall be made safe before persons are allowed to conduct other work in the excavation.

(5) Sloping of the sides of excavations may be undertaken instead of shoring only where the protection afforded to personnel is equivalent to that provided by shoring.

(6)Where excavation walls are sloped as a substitute for shoring, the walls shall be sloped at angles, dependent upon soil or rock conditions, which will provide stable faces. In no case shall such a slope be steeper than a ratio of one horizontal to one vertical.

When shoring is installed or removed, the work procedure shall ensure that persons are not exposed to undue risk.

Uranium & Thorium

9.3.4 Unless the chief inspector permits otherwise, where standard assay results are expected to show, or are expected to show uranium mineralization in a grade of 0.15% by weight or greater or thorium mineralization in a grade of 0.15% by weight or greater, the owner agent or manager shall ensure that

(a) all drill holes must be completely sealed with concrete on completion of exploration,
(b) all practicable precautions are taken to ensure no drilling fluid, water or drill cuttings contaminate any drinking water supply, irrigation water supply, or surface water,
(c) all persons working at the exploration site are provided with a gamma radiation dosimeter of an approved type, and
(d) no person is exposed to a whole body dose of more than 5 millisieverts in a 12 month period.

Induced Polarization Geophysical Survey Systems

9.3.5 (1) Where an induced polarization geophysical system is being operated
(a) energized wires shall be sufficiently insulated to prevent electric shock,
(b) induced polarization electrodes shall have visible warning stickers stating "Danger - High Voltage,"
(c) signs shall be posted to warn other persons who may enter the area,
(d) electronic communication shall be provided to every member of the crew whose movements are out of sight and sound of the other crew members, and
(e) all signs shall be removed on completion of the survey and no wires used during the survey shall be left on the site after the survey is completed.
(2) Electric blasting activities shall be coordinated with active induced polarization and active electromagnetic survey work.

Use & Storage of Explosives

9.3.6 (1) The use and storage of explosives shall be pursuant to the provisions of Part 8 of this Code.
(2) Blasters shall have a valid blasting certificate granted pursuant to Part 8 of this Code.

Community Watersheds

9.4.1 (1) Exploration activities shall
(a) maintain surface and subsurface drainage patterns within the range of natural variability,
(b) protect stream channel stability, and
(c) not degrade water quality at a potable water supply intake so that it fails to meet the potable water requirements of the *Drinking Water Protection Act* and regulations as amended from time to time.

Notification Requirements

9.4.2 An owner, agent or manager responsible for exploration activities in a community watershed shall
(a) notify, at least 48 hours prior to the start date of the activities, the water license holder of record or the representative of record,
(b) prior to commencing work ensure a contingency plan is in place to restore potable water in the event that exploration activities adversely impact potable water quality and quantity, and
(c) immediately cease exploration activities and take remedial action if those activities adversely impact potable water quality and quantity.

RIPARIAN MANAGEMENT

Table 9.1

RIPARIAN SETBACK DISTANCES

(Measured horizontally from the top of bank)

Riparian Type		Drilling (m)	Exploration Access (m)
Stream	Stream widths (m)		
	>20	50	70
	>5≤20	30	50
	1.5≤5	20	40
	<1.5	5	30
	<0.5 in alpine areas above timberline	5	15
Wetland	Wetland Size (ha)		
	> 5	10	30
	>1.0 - < 5.0	10	20
	> 0.25 - < 1.0	10	10
Lake		10	30

9.5.1 (1) The following activities may be carried out within the setback distances noted in Table 9.1

(a) construction, maintenance, deactivation and reclamation of stream crossings;

(b) access from water landings for the purpose of servicing exploration camps and equipment;

(c) access to set up and service water supply pumps and lines; and

(d)access to service drill sites.

(2) Exploration activities in addition to those in (1) may occur within the riparian setback distances noted in Table 9.1 when one or more of the following conditions apply

(a) no other practicable option exists;

(b) risk to health and safety can be reduced; or

(c) risk of adverse impact to the environment can be reduced.

(3) When there is an intent to operate within the riparian setback distances noted in Table 9.1 pursuant to (2) the owner, agent or manager shall prepare a management plan, acceptable to an inspector, shall be approved and the plan must show how the proposed activities will to the extent practicable
(a) maintain the integrity of the stream, lake or wetland;
(b) prevent the introduction of deleterious substances into a stream, lake or wetland; and
(c) minimize the disturbance caused by the activity.

Soil Conservation

9.6.1 Exploration activities shall be carried out in a manner that minimizes soil loss so that the site can be reasonably reclaimed to support appropriate self-sustaining vegetation.

Terrain

9.7.1 (1) Exploration activities shall be designed and implemented by a qualified person to minimize the risk of those activities causing any of the following events
(a) landslide,
(b) channelized debris or mud flow,
(c) gully bank destabilization
(d) debris fan,
(e) snow avalanche, or
(f) destabilization of an alluvial fan.
(2) If an exploration activity causes an event as noted in section 9.7.1 the owner agent or manager shall as soon as practicable
(a) take necessary steps to protect human life and safety,
(b) stabilize any disturbed areas,
(c) promptly report the event to an inspector, and

(d) where the event as noted in section 9.7.1
  (i) places human life or safety at risk,
  (ii) damages property or infrastructure,
  (iii) adversely affects water quality, or damage water supply infrastructure,
  (iv) results in harmful alteration to fish habitat, or
  (v) results in harmful alteration of regionally significant wildlife habitat.

Ensure the preparation, within 30 days, by a qualified person of a remediation plan acceptable to an inspector and implement the plan within a time frame specified by the inspector.

Water Management

9.8.1 (1) Where exploration activities or exploration access may impact the natural surface and subsurface drainage of an area, structurally sound, functional and stable drainage systems shall be constructed that minimize
(a) water flowing uncontrolled onto the exploration site,
(b) erosion or destabilization of the exploration site,
(c) water being directed onto, or creating, potentially unstable slopes or soil materials, and
(d) water flowing onto reclaimed areas unless the reclaimed areas are protected with the use of riprap or other effective means or the water flow is an integral part of the reclamation scheme.

Fuel & Lubricants

9.9.1 (1) Liquid hydrocarbon products shall be stored within a containment that minimizes the possibility of accidental discharge to the environment.
(2) Unless authorized by an inspector, bulk liquid hydrocarbon products shall not be stored within 30 meters of a stream, lake or wetland.

(3) Ground-based machinery shall not be fueled or serviced within the riparian setback distances for drilling specified in Table 9.1, other than pumps and machinery that are

(a) hand held,

(b)required for fire fighting,

(c) broken down and requiring fueling or servicing to be moved, or

(d) authorized by an inspector to be fueled or serviced in the area.

(4) The owner, agent or manager shall remove all hydrocarbon containers, whether empty or full, from every exploration site by the end of each field season, unless otherwise authorized by an inspector.

Exploration Access

9.10.1 (1) The construction, maintenance, deactivation and reclamation of exploration access and bridges or any other form of a stream, lake or wetland crossing shall result in exploration access and crossings that are stable, safe for the intended use, and which

(a) minimize erosion, mass wasting or the degradation of a stream, lake or wetland by the introduction of sediment, debris or deleterious matter,

(b) minimize adverse impacts on stream channels,

(c) make provision for drainage systems that maintain stability of the road prism,

(d) do not cause harmful alteration, damage or destruction of fish habitat, and

(e) has the minimum surface disturbance necessary to complete the proposed work.

(2) Clearing of standing timber shall not exceed the minimum required to accommodate the road prism, user safety and other operational requirements.

(3) Material known to be capable of generating acid rock drainage shall not be used for exploration access surfacing or ballasting unless approved by an inspector.

(4) Exploration access shall not interfere with the subsurface flow of a drainage area that contributes to a water supply used for licensed domestic consumption unless

(a) there is no other practicable option, and

(b) the impacts of the access construction can be mitigated.

(5) There shall be a program to routinely monitor and maintain exploration access as necessary and prudent so that it is stable and safe for the intended use until it is reclaimed to the satisfaction of an inspector.

(6) Deactivation of exploration sites and access shall result in

(a) stabilization of the exploration site, access road prism and clearing widths,

(b) restoration or maintenance of drainage patterns, and

(c) minimization of soil erosion to the extent practicable.

(7) Reclamation of exploration access shall result in

(a) restoration of drainage patterns,

(b) removal of bridge superstructures,

(c) removal of bridge substructures if failure would affect downstream values,

(d) removal of all stream culverts,

(e) a stable surface that minimizes future erosion, and

(f) the establishment of self sustaining vegetation appropriate for the site which may include reforestation if so directed by an inspector.

(8) Stream crossings shall be constructed, maintained, deactivated and reclaimed in a manner that allows safe fish passage and protects fish habitat at, above and below the stream crossing.

(9) Stream crossings on streams that do not contain fish shall be constructed, maintained, deactivated and reclaimed in a manner that does not adversely affect downstream fish values.
(10) An owner, agent or manager shall ensure that bridge design and fabrication is certified or approved by a qualified person.
(11)An owner, agent, or manager shall ensure that
(a) metal and concrete bridges are inspected by a qualified person at least once every three years, and other bridges at least once every two years, or as prescribed by the designer,
(b) inspection records are maintained for the life of any bridge structure, and
(c) any deficiencies identified as a result of an inspection are corrected as soon as practicable.
(12) Bridges, stream culverts and their approaches shall be designed, constructed and maintained to pass the peak flows set out in Table 9.2.
(13) Despite 9.10.1 (12) a temporary bridge or stream culvert may be constructed at a crossing to meet the expected flow during the period of use if
(a) the stream is not a fish stream,
(b) the installation and use will be in a period of low annual stream flows, and
(c) the culvert or temporary bridge is removed before the period of high annual stream flows.

TABLE 9.2
MINIMUM DESIGN PEAK FLOW

CROSSING TYPE	RETURN PERIOD (years)
Permanent bridges	100
Temporary bridges	50
All stream culverts	100

Drilling

9.11.1 (1) Drill sites shall not be located

(a) within a stream,

(b) within a lake unless a management plan has been approved by an inspector, or

(c) within a known wetland unless

- (i) the exploration activity is conducted when the ground is frozen,
- (ii) at the time that work is conducted there is no standing water at the drill site, or
- (iii) a management plan has been approved by an inspector,

(d) within a riparian setback area as defined in Table 9.1,

- (i) unless authorization has been obtained pursuant to the provisions of sections 9.5.1(2) and 9.5.1(3), and
- (ii) management plans shall include provision for management of drilling discharge.

(2) An owner, agent or manager shall ensure that pumps and pump fuel supplies use absorbent mats and containment devices to prevent spilled liquid hydrocarbons from escaping.

(3) During drilling operations, practicable measures shall be taken to manage the flow of drilling discharge, and minimize the impact on streams, wetlands or lakes.

(4) Appropriate emergency spill kits shall be readily available at all active drill and water supply pump sites.

(5) Groundwater shall not be permitted to flow from completed drill holes without the written authorization of an inspector.

(6) Upon abandonment of an exploration drill site, all equipment, waste and other refuse shall be disposed of properly.

Camps

9.12.1 (1) An exploration camp required to support future exploration activities shall be left in a clean and safe condition and where practicable secured from wildlife access at the end of each field season.

(2) An exploration camp not required to support future exploration activities shall be dismantled, removed and the site reclaimed, unless otherwise exempted in writing by an inspector.

(3) Before leaving a camp for the season or reclaiming a camp site, all refuse shall be removed or burned and buried so that it will not attract wildlife, refuse pits shall be backfilled, and food and explosives removed from the site.

Reclamation

9.13.1 (1) Reclamation of mechanically disturbed sites, campsites and exploration access shall occur within one year of cessation of exploration unless authorized in writing by an inspector.

(2) Pits and trenches shall be backfilled and reclaimed prior to abandonment, unless

(a) the sides of the pit or trench are sloped to a stable and safe angle as determined by a qualified person, or the pit or trench is fenced to prevent inadvertent access, and

(b) there is a means of egress.

(3) Appropriate measures shall be taken to minimize the establishment of noxious weeds and the erosion of exposed or disturbed soil.

(4) Exploration sites shall be revegetated to a self-sustaining state with species appropriate for the site.

(5) The results of reclamation measures shall be reported to an inspector upon completion of the reclamation work.

(6) Where a security deposit has been posted for reclamation, the owner, agent or manager may apply to an inspector in writing for a refund of the security deposit when the reclamation program has met the requirements of this code.

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Definitions

"*dam*" means a barrier on the surface preventing uncontrolled release of either water, slurry or solids or a barrier underground to prevent the uncontrolled flow of water, slurry or solids.

"*dike*" means a bank, usually of earth, to control or to confine water, a levee, or a barrier forming a reservoir or pond.

"*dump*" means the accumulation of rock fragments or other unconsolidated material formed by pushing or dropping loose material over a crest and allowing it come to rest without further handling.

"*fill*" means a deposit of discrete particles, either loose or well compacted, placed in layers or dumped into a ravine, valley, or depression.

"*impoundment*" means a body of water, slurry or solids that is confined by natural and/or constructed barriers and includes those barriers and related items.

"*land capability*" means the capability of achieving a specified land use estimated by limitations as a result of climate, topography and soils.

"*major dam*" means a dam that is used to store and control water, slurry or solids and has a maximum height at any point that exceeds 15 metres or is between 10 and 15 metres in height and has either a crest length that exceeds 500 metres, a flood discharge rate that exceeds 2000 cubic metres per second, a reservoir capacity that exceeds one million cubic metres, or any other dam so declared by the chief inspector.

"*major dump*" means a dump that contains a volume of dumped material that exceeds one million cubic metres, or has a dump height greater than 50 metres, or has an area that is covered by a dump that exceeds one hectare, or is founded upon natural or trimmed slopes that are sometimes steeper than 20 degrees from a horizontal plane, or contains material dumped or placed in a water course having a potential peak flow greater than one cubic metre per second, once in every 200 years, or any other mine dumps so declared the chief inspector.

"*major impoundment*" means an impoundment that has a maximum depth of material greater than 10 metres at any point, or a maximum height of retaining dam or dike at any point that exceeds 15 metres, or is a storage facility designed to contain more than one million cubic metres of material or is constructed with dams or dikes that contain more than 50000 cubic metres of fill, or any other impoundment or water management facility so declared by the chief inspector.

"*overburden*" means all unconsolidated soil material overlying bedrock.

"*permit*" means a permit issued pursuant to section 10(3) of the *Mines Act*.

"*stability*" means the safety of an earth mass against structural failure or movement.

Definitions (*continued*)

"*surficial soil material*" means those soils commonly contained in the upper layers of the overburden mass, which are suitable for use in reclamation, either as growth medium, soil covers and seals, or other reclamation requirements.

"*tailings*" means the residue remaining from the preparation of a concentrate of minerals or coal.

"*watercourse*" means any natural stream or source of water, whether usually containing water or not, and includes any lake, river, creek, spring, ravine, swamp, and gulch.:

Mine Plan And Reclamation Program Information

Proposed Placer Mines, Gravel Pits and Quarries

10.1.1 The proposed mine plan and reclamation program filed with the inspector in compliance with section 10(1) of the *Mines Act*, shall consist of the appropriate Notice of Work forms together with such other information as the inspector may require, for approval of placer mining, sand and gravel pits, rock quarries and industrial mineral quarries. No work shall proceed without the inspector granting a permit or authorization or the chief inspector granting an exemption pursuant to Section 10.2 of the *Mines Act*.

Proposed Coal and Mineral Mines, Major Modifications to Existing Mines & Major Exploration and Development

Producing Mines

10.1.2 The owner, agent or manager shall submit in writing, an application to the chief inspector for a permit under section 10(1) of the *Mines Act* for

(1) surface or underground development or production for coal and mineral mines, or major expansions or major modifications of existing producing coal and mineral mines, or

(2) underground exploration requiring excavation, large pilot projects, bulk samples, trial cargos or test shipments.

(3) no work shall proceed without the chief inspector granting a permit or authorization.

Application Requirements

10.1.3 The chief inspector will determine the number of copies of the application required.

10.1.4 The application shall include the following

Map

(1) a regional map showing the location of the mine property, along with a map or air photo showing the location and extent of the mine.

Baseline Information

(2) the present use and condition of the land and watercourses including
  - (a) land ownership, including surface and mineral rights, licensed or permitted users such as water users, guides, outfitters, trappers and grazing licenses,
  - (b) climate,
  - (c) general geology and detailed geological descriptions of the deposit,
  - (d) surface water and groundwater quality and flow,
  - (e) fisheries and aquatic resources,
  - (f) air quality,
  - (g) surficial geology and terrain mapping,
  - (h) soil survey and soil characterization,
  - (i) vegetation,
  - (j) wildlife,
  - (k) land capability and present land uses such as agriculture, forestry, fisheries, wildlife, recreation, industrial, commercial and residential, and
  - (l) inhabited places in the vicinity of the mine.

Mine Plan

(3) a mine plan including
  - (a) a map at a scale of 1:10,000 or less showing topographic contours, surface drainage features, claims, leases or licences, buildings, roads, railways, power transmission lines, pipelines, and other relevant features and the locations of all proposed or existing surface and underground mining developments, waste disposal areas, stockpiles, processing facilities, mine buildings and other mining related disturbances or infrastructure.

(b) an inventory of areas disturbed to date, and projected over the next five years and over the projected life of the mine,

(c) descriptions of mining methods, mining rates, projected mine life, processing methods and infrastructure requirements,

(d) development schedule for construction and mine sequencing,

(e) detailed geology and ore reserves, and projected volumes of ore and waste to be produced and relative time of production,

(f) designs and details for dumps, open pits, impoundments, underground workings including areas that may be affected by subsidence, stockpiles, processing facilities, water management structures, water storage and/or water treatment facilities, haulage roads, road construction and significant transportation or utilities infrastructure, compatible with environmental protection, reclamation and mine closure,

(g) designs for material handling and waste disposal procedures,

(h) salvaging and stockpiling of surface soils and overburden materials,

(i) source, use and water balance for any water required in the operation,

(j) overall site water balance, and

(k) a traffic control procedure as required under section 6.8.3 of this code.

Plan for Environmental Protection

(4) a program for the environmental protection of land and watercourses during the construction and operational phases of the mining operation, including plans for

(a) prediction, and if necessary, prevention, mitigation and management of metal leaching and acid rock drainage,

(b) erosion control and sediment retention,

(c) environmental monitoring and surveillance designed to demonstrate that
   (i) objectives of section 10.1.4(5) of this code are being met,
   (i) reclamation standards as outlined in section 10.7 of this code are being met, and
   (ii) environmental protection of land and watercourses required under sections 10.1.4. (7) (a) (b) of this code are being achieved and maintained.

Annual Report

(5) the owner, agent or manager shall submit an annual report of reclamation and environmental monitoring work performed under section 10.1.4 (4) of this code, in a summary form specified by the chief inspector or by conditions of the permit, by March 31 of the following year.

Reclamation Plan

(6) operational reclamation plans for the next five years.

(7) a conceptual final reclamation plan for the closure or abandonment of all aspects of the mining operation, including
   (a) plans for long term post-closure maintenance of facilities, and
   (b) proposed use and capability objectives for the land and watercourses,.

Cost Estimate

(8) an estimate of the total expected costs of outstanding reclamation obligations over the planned life of the mine, including the costs of long term monitoring and maintenance. With the approval of the chief inspector, such information may be filed in a separate confidential report, and

Other Information

(9) any other relevant information required by the chief inspector.

Design Standards

10.1.5 Major impoundments, water management facilities and dams shall be designed in accordance with the criteria provided in the Canadian Dam Association, Dam Safety Guidelines.

10.1.6 Major dumps shall be designed in accordance with the Interim Guidelines of the British Columbia Mine Waste Rock Pile Research Committee.

10.1.7 Major dumps shall be designed so as to allow for re-contouring such that final reclamation is consistent with the approved end land use.

10.1.8 Tailings impoundments, water management facilities, dams and waste dumps shall be designed by a professional engineer.

10.1.9 Plans for the prediction, and if necessary, the prevention, mitigation and management of metal leaching and acid rock drainage shall be prepared in accordance with the Guidelines for Metal Leaching and Acid Rock Drainage at Minesites in British Columbia.

Preparation of Plans and Programs

10.1.10 The mine plan and reclamation program required under sections 10.1.1, 10.1.2 and 10.6 of this code shall
(1) be prepared taking into consideration the health and safety of the public and persons involved in the work,
(2) be designed so as to make it as practicable as possible in the future to mine zones affected by the plan,
(3) be designed to protect the land and watercourses, and

(4) when required by the chief inspector, be prepared by licensed professionals, or persons who in the opinion of the chief inspector are qualified to perform the work.

Departure From Approval **10.1.11** The owner, agent or manager shall notify the chief inspector in writing of any intention to depart from the mine plan and reclamation program authorized under sections 10.1.1 or 10.1.2 of this code to any substantial degree, and shall not proceed to implement the proposed changes without the written authorization of the chief inspector.

Exceptions **10.1.12** Sections 10.1.2 through 10.1.10 of this code do not apply to placer mines, sand and gravel pits, and quarries unless required by the chief inspector.

Notice Of Filing

Publication **10.2.1** When required by an inspector, notice of filing an application under section 10(1) of the *Mines Act* shall be published, by the person filing it, in the Gazette and in local newspapers.

Written Response **10.2.2** Where a notice of filing has been published under section 10.2.1 of this code, a person affected by, or interested in, the application has 30 days after the last date on which the notice was published to view the application and make written representations to the chief inspector.

Referral To Other Agencies

Mine Development Review Committee

10.3.1 The chief inspector may refer to the advisory committee or the regional advisory committee established pursuant to section 9 of the *Mines Act*, applications submitted under section 10.1.2 of this code and may, where he deems it to be appropriate, refer any Notice of Work submitted under section 10.1.1 of this code.

10.3.2 The advisory committee or regional advisory committee shall review every application referred to them and make recommendations to the chief inspector within 60 days following application. Where no response has been received within 60 days, the chief inspector will deem that there are no concerns.

Circulation of Application

10.3.3 Where a permit application under section 10.1.1 of this code is not referred to a committee for review under section 10.3.1 of this code, an inspector may circulate it to other ministries and agencies and they will have 30 days following referral to make written representations to the inspector. Where no response has been received within 30 days, the inspector will deem that there are no concerns.

Permit

10.4.1 A permit issued under section 10(1) of the *Mines Act* shall take into consideration
(1) any written representations received under section 10.2.2 of this code,
(2) any recommendations made by a committee under section 10.3.2 of this code, and
(3) any written representations received under section 10.3.3 of this code.

Operations

Impoundments

10.5.1 The manager shall ensure that the operation of a tailings or water management facility does not commence until an "as-built" report prepared by a professional engineer certifying that the facility was designed and constructed according to section 10.1.5 of this code has been submitted to the chief inspector and a permit to operate the facility has been received.

10.5.2 An Operation, Maintenance and Surveillance (OMS) manual shall be prepared and provided to an inspector and to all employees involved in the operation of a major dam or major impoundment, prior to commissioning. The manual shall be revised regularly during operations, decommissioning and closure of the structure.

10.5.3 The manager shall submit an annual dam safety inspection report prepared by a professional engineer on the operation, maintenance and surveillance of the tailings and water management facilities and associated dams to the chief inspector.

Dumps

10.5.4 Major dumps shall be operated and monitored in accordance with the Interim Guidelines of the British Columbia Mine Waste Rock Pile Research Committee.

10.5.5 The manager shall submit an annual report on the performance of high-risk dumps to the chief inspector.

10.5.6 Material with a high probability of spontaneous combustion shall be placed in a separate dump.

Materials Inventory

10.5.7 Where required for the control of metal leaching and acid rock drainage, the owner, agent or manager shall maintain an inventory of identified material that includes

(1) composition, mass, volume, surface area, and storage locations,
(2) history and timing of excavation,
(3) monitoring data, and
(4) upon closure, the manager shall submit the material inventory to the chief inspector, and
(5) any other information required by the chief inspector.

Excavations Near Property Boundaries

10.5.8 The excavation of soil material such as clay, silt, earth, sand or gravel, in a surface mine shall not be carried on within a setback distance of at least 5 metres horizontal from the vertical plane of the property boundary, and
(1) there shall be no excavation of soil material below a surface sloping downwards into the property from the inside edge of the setback no steeper than 1.5 horizontal to 1 vertical, and
(2) material that sloughs from within this distance shall not be removed without the written approval of the inspector.

10.5.9 The chief inspector may direct that any excavation that exists in soil materials on or before April 1, 1997 will not be considered to be out of compliance for not meeting setback requirements providing that all further excavation is conducted in a manner consistent with the requirements of section 10.5.8.

10.5.10 Notwithstanding sections 10.5.8 and 10.5.9, the chief inspector may approve a mine plan, prepared by a professional engineer, with alternative setbacks and slopes which ensure that the property boundary will be adequately protected.

10.5.11 Rock shall not be excavated within a distance of 5 m from the property boundary.

10.5.12 The owners of adjoining properties may, be agreement in writing, waive the provisions of sections 10.5.8, 10.5.9 and 10.5.11.

Mine Closure

Notice Required

10.6.1 The owner, agent, or manager shall provide written notice of not less than 7 days to an inspector of intention to stop work in, on, or about a mine.

10.6.2 If a mine ceases operation the owner, agent, or manager shall
(1) continue to carry out the conditions of the permit,
(2) carry out a program of site monitoring and maintenance, and
(3) if a mine ceases operation for a period longer than one year, the owner, agent, or manager shall apply for an amendment setting out a revised program for approval by an inspector.

Filing of Plans

10.6.3 On the closure of a mine, the owner, agent or manager shall, within 90 days file with the chief inspector accurate drawings, on a scale consistent with good engineering Practice, showing
(1) on a plan view
    (a) the surface and underground workings of the mine up to the time of closure and the boundaries of the mineral claims, licences, or leases in which the workings are situated, and
    (b) identification of underground workings that come to within 25 meters of the surface.
(2) a general long section and several cross section views of the surface and underground mine workings, and
(3) any other plans that may be requested by the chief inspector.

10.6.4 The filed plans shall be preserved as a permanent record in the office of the chief inspector.

Securing of Openings

10.6.5 When a mine is closed for an indefinite period, or otherwise left unattended for any length of time, the owner, agent or manager shall take all practible measures to prevent inadvertent access to mine entrances, pits and openings that are dangerous by reason of their depth or otherwise, by unauthorized persons and ensure that the mine workings and fixtures remain secure.

Major Dumps

10.6.6 The long-term stability of exposed slopes of any major dump shall meet the criteria provided in the Interim Guidelines of the British Columbia Mine Waste Rock Pile Research Committee at the time of permitting or as amended by the chief inspector.

Major Impoundments

10.6.7 The long-term stability of exposed slopes of major impoundments shall meet the criteria provided in the Canadian Dam Association, Dam Safety Guidelines at the time of permitting or as amended by the chief inspector.

10.6.8 A major impoundment classified as high and very high failure consequence during operation and closure shall have an Emergency Preparedness Plan.

10.6.9 A major impoundment not operated for a period of 12 or more months may be declared as closed by the chief inspector.

10.6.10 Upon closure or declared closure of a major impoundment, the manager shall submit a report to the chief inspector

(1) listing the steps that will be taken to ensure structural stability and runoff control, and

(2) detailing the post-operational state of the dams, dikes, related seepage control works, spillway works, mine water deportment, and post-operational monitoring provisions.

10.6.11 The owner, agent or manager shall make an application for a permit to reactivate a closed or abandoned major impoundment.

On-going Management Requirements

10.6.12 Where a mine requires on-going mitigation, monitoring or maintenance, the owner, agent, or manager shall submit a closure management manual that
(1) describes and documents key aspects of the ongoing mitigation, monitoring and maintenance requirements, and
(2) tracks important changes to components of the system that effect long-term mitigation, monitoring and maintenance requirements.

Decommissioning of Water Structures

10.6.13 A water reservoir or pond declared inoperative by the chief inspector shall be breached or otherwise disposed of in accordance with the license under the *Water Act* or permit under the *Waste Management Act*.

Security

10.6.14 On the closure of a mine, and on the chief inspector being satisfied that some or all the conditions of the permit have been complied with, the person who deposited a security under section 10 (4) or 10 (5) of the *Mines Act* shall be entitled to refund of some or all of the security and any accumulated interest, less any amount paid out under section 10 (8) of the *Mines Act*.

10.6.15 An application for security release or a partial security release, shall be submitted to the chief inspector that details the reclamation activities that have been completed under the requirements of the act, the code, and approved reclamation plan.

Reclamation Standards

Reclamation Defined

10.7.1 It is the duty of every owner, agent, and manager to institute and during the life of the mine to carry out a program of environmental protection and reclamation, in accordance with the standards described in this section.

Pre-legislation Disturbances

10.7.2 Where environmental disturbance occurred at a site prior to the enactment of reclamation legislation in 1969, and has remained inactive since this time, the portion of environmental disturbance which occurred before the enactment of reclamation legislation in 1969, is exempt from the re-vegetation provisions.

Exclusions

10.7.3 A reclamation standard prescribed under section 10.7 of this code does not apply where
(1) a mine is specifically excluded by a condition of its permit from complying with a particular standard, or
(2) a disturbance created by a mining activity has been reclaimed, inspected, and found to be satisfactory to an inspector.

Land Use

10.7.4 The land surface shall be reclaimed to an end land use approved by the chief inspector, that considers previous and potential uses.

Capability

10.7.5 Excluding lands that are not to be reclaimed, the average land capability to be achieved on the remaining lands shall not be less than the average that existed prior to mining, unless the land capability is not consistent with the approved end land use.

Long Term Stability

10.7.6 Land, watercourses and access roads shall be left in a manner that ensures long-term stability.

Re-vegetation

10.7.7 On all lands to be re-vegetated, land shall be re-vegetated to a self-sustaining state using appropriate plant species.

Growth Medium

10.7.8 On all lands to be re-vegetated, the growth medium shall satisfy land use, capability, and water quality objectives. All surficial soil materials removed for mining purposes shall be saved for use in reclamation programs unless these objectives can be otherwise achieved.

Landforms

10.7.9 Where practicable, land and watercourses shall be reclaimed in a manner that is consistent with the adjacent landforms.

Structures and Equipment

10.7.10 Prior to abandonment, and unless the chief inspector has made a ruling with respect to heritage project status
(1) all machinery, equipment and building superstructures shall be removed,
(2) concrete foundations shall be covered and revegetated, and
(3) all scrap material shall be disposed of in a manner acceptable to an inspector.

Dumps

10.7.11 Dumps shall be reclaimed to ensure
(1) long-term stability, and
(2) long-term erosion control.

Watercourses

10.7.12 Watercourses shall be reclaimed to a condition that ensures
(1) drainage is restored either to original watercourses or to new watercourses which will sustain themselves without maintenance, and
(2) the level of productive capacity shall not be less than existed prior to mining, unless the owner, agent or manager can provide evidence which demonstrates, to the satisfaction of the chief inspector, the impracticality of doing so.

Open Pits

10.7.13 Pit walls constructed in overburden shall be reclaimed in the same manner as dumps unless an inspector is satisfied that to do so would be unsafe or conflict with other proposed land uses.

10.7.14 Pit walls including benches constructed in rock, and/or steeply sloping footwalls, are not required to be re-vegetated.

10.7.15 Where the pit floor is free from water, and safely accessible, vegetation shall be established.

10.7.16 Where the pit floor will impound water and it is not part of a permanent water treatment system, provision must be made to create a body of water where use and productivity objectives are achieved.

Impoundments

10.7.17 All tailings ponds and impoundment structures shall be reclaimed to the approved land use.

10.7.18 Impoundment facilities shall be inspected, monitored and maintained to ensure stability.

Spillways

10.7.19 All permanent spillways shall be designed by a professional engineer in accordance with the Canadian Dam Association Dam Safety Guidelines and installed prior to final abandonment of the tailings dam.

Securing Openings

10.7.20 All access roads to surface areas of the mine that may be dangerous shall be effectively blocked to prevent inadvertent vehicular access.

10.7.21 All shafts, raises, stope openings, adits, or drifts opening to the surface shall be either capped with a stopping of reinforced concrete or filled with material so that subsidence of the material will not pose a future hazard.

10.7.22 In the case of shafts or raises, the stopping shall be secured to solid rock or to a concrete collar secured to solid rock and capable of supporting a uniformly distributed load of 12 Kpa or a concentrated load of 24 kn, whichever is greater.

10.7.23 Where there is evidence or a potential for use by wildlife, mine openings may be fitted with a barrier that allows wildlife passage but prevents human entry.

10.7.24 When mine openings are permanently closed and where it may be possible for mine water to build dangerous pressures and cause a blow-out of the fill or concrete with sudden and dangerous force, a permanent and effective drain shall be installed.

Metal Uptake

10.7.25 When required vegetation shall be monitored for metal uptake.

10.7.26 When required by the chief inspector, the owner, agent or manager shall commission an ecological risk assessment.

10.7.27 Where there is a significant ecological risk, reclamation procedures shall ensure that levels are safe for plant and animal life and, where this cannot be achieved, other measures shall be taken to protect plant and animal life.

Disposal of Chemicals and Reagents

10.7.28 Chemicals or reagents, which cannot be returned to the manufacturer, shall be disposed of in compliance with municipal, regional, provincial and federal statutes.

Water Quality

10.7.29 If water quality from any component of the mine results in exceedances of applicable provincial water quality standards in the receiving environment, when required by the chief inspector, remediation strategies shall be implemented for as long as is necessary to mitigate the problem.

Monitoring

10.7.30 The owner, agent, or manager shall undertake monitoring programs, as required by the chief inspector, to demonstrate that reclamation and environmental protection objectives including land use, productivity, water quality and stability of structures are being achieved.

Release of Obligations

10.7.31 If all conditions of the act, code and permit have been fulfilled to the satisfaction of the chief inspector and there are no on-going inspection, monitoring, mitigation or maintenance requirements, the owner, agent or manager will be released from all further obligations under the *Mines Act*.

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